

# Exhibit 33

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UNITED STATES DISTRICT COURT  
FOR THE NORTHERN DISTRICT OF CALIFORNIA  
SAN FRANCISCO DIVISION

\_\_\_\_\_) Case No.  
IN RE: BABY FOOD PRODUCTS )  
LIABILITY LITIGATION ) 24-MD-3101-JSC

\_\_\_\_\_) MDL 3101

)  
This document relates to: )

)  
ALL ACTIONS )

\_\_\_\_\_) )  
  
\* CONFIDENTIAL PURSUANT TO PROTECTIVE ORDER \*

VIDEOTAPED DEPOSITION of HANNAH E. GARDENER, SC.D.

Thursday, July 31, 2025

9:07 a.m.

DLA Piper LLP

33 Arch Street

Boston, Massachusetts 02110-1447

Job No.: 2500

Pages: 1 - 329

Reported By: Michelle Keegan, RMR, CRR, CSR

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Also Present:

Gil Whitney, Videographer

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| Page 7  | Page 8  |
| <p>1 PROCEEDINGS</p> <p>2 THE VIDEOGRAPHER: We are now on the</p> <p>3 record. Today's date is July 31st, 2025, and the</p> <p>4 time is 9:07 a.m.</p> <p>5 My name is Gil Whitney. I am the</p> <p>6 videographer for Hartford Reporting &amp; Technology</p> <p>7 in the case of Baby Food Products Liability</p> <p>8 Litigation, MDL Number 3101.</p> <p>9 This deposition is being taken at 33 Arch</p> <p>10 Street, Boston, Massachusetts, in the United</p> <p>11 States District Court for the Northern District of</p> <p>12 California, San Francisco Division.</p> <p>13 The deponent today is Hannah E. Gardener,</p> <p>14 Sc.D.</p> <p>15 The court reporter today is Michelle</p> <p>16 Keegan, and she will now swear the witness after</p> <p>17 the counsel identify themselves for the record.</p> <p>18 MR. KLATT: Mike Klatt for defendant</p> <p>19 Sprout Foods, Inc.</p> <p>20 MS. FOUHEY: Elizabeth Fouhey on behalf of</p> <p>21 the Hain Celestial Group.</p> <p>22 MR. SACHSE: Will Sachse on behalf of</p> <p>23 Plum.</p> <p>24 MR. ESFANDIARY: Pedram Esfandiary for the</p> <p>25 plaintiffs and Dr. Gardener.</p> | <p>1 MR. KLATT: I don't know if anyone on the</p> <p>2 video wants to make an appearance.</p> <p>3 MS. VULIN: Ashley Vulin with Davis Wright</p> <p>4 Tremaine, appearing on behalf of Amazon.</p> <p>5 MS. TOLEDO: Carmen Toledo from King &amp;</p> <p>6 Spalding for defendants Beech-Nut Nutrition</p> <p>7 Company and Walmart, Inc.</p> <p>8 HANNAH E. GARDENER, SC.D.,</p> <p>9 having been satisfactorily identified and duly</p> <p>10 sworn by the Notary Public, was examined and</p> <p>11 testified as follows:</p> <p>12 EXAMINATION BY COUNSEL FOR</p> <p>13 DEFENDANT SPROUT FOODS, INC.</p> <p>14 BY MR. KLATT:</p> <p>15 Q. Good morning, Dr. Gardener.</p> <p>16 A. Good morning.</p> <p>17 Q. My name is Mike Klatt. We met just a</p> <p>18 couple of minutes ago for the first time.</p> <p>19 Correct?</p> <p>20 A. Correct.</p> <p>21 Q. All right. Nice to meet you this morning.</p> <p>22 Can you just state your full name for the</p> <p>23 record.</p> <p>24 A. My name is Hannah Gardener.</p> <p>25 Q. Okay. You've given depositions before,</p> |

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|---|--|
| <p style="text-align: right;">Page 9</p> <p>1 haven't you?</p> <p>2 A. I have.</p> <p>3 Q. I just want to give you a few reminders.</p> <p>4 I'm sure you know these things.</p> <p>5 Is there any reason here today that you</p> <p>6 can't give full, truthful, and complete answers,</p> <p>7 whether it's due to medications, any stressful</p> <p>8 events in your life, anything else going on?</p> <p>9 A. No.</p> <p>10 Q. Okay. You understand we can take a break</p> <p>11 anytime you need one as long as there's not a</p> <p>12 question pending?</p> <p>13 A. Yes, I do.</p> <p>14 Q. And the court reporter would appreciate</p> <p>15 and I would appreciate if you could give verbal</p> <p>16 answers rather than "uh-huhs" or "mm-hmms." I'll</p> <p>17 try to remember to correct you if you do that.</p> <p>18 I've read your testimony in the past. It</p> <p>19 doesn't seem like that's a problem, but if you</p> <p>20 could just keep that in mind that would be great.</p> <p>21 A. Sure. I've gotten a little bit better</p> <p>22 over time, but I'm not perfect with that.</p> <p>23 Q. Try not to get in a hurry. If you would,</p> <p>24 let me finish my question before you start your</p> <p>25 answer, and I will try to let you finish your</p> | <p style="text-align: right;">Page 10</p> <p>1 answer before I start my question, next question,</p> <p>2 if that's okay.</p> <p>3 A. Sounds good.</p> <p>4 Q. But in fairness, if you would give</p> <p>5 responsive answers, I think the day will go</p> <p>6 quicker and also that will avoid us having to</p> <p>7 repeat questions and things like that. Is that</p> <p>8 fair?</p> <p>9 A. Yes.</p> <p>10 Q. Okay. Thank you. And of course, if you</p> <p>11 don't understand my question -- and that's very</p> <p>12 possible -- please let me know and I'll be happy</p> <p>13 to rephrase it so you can understand it. Is that</p> <p>14 fair?</p> <p>15 A. Yes, I will.</p> <p>16 Q. Okay. I count that you've given at least</p> <p>17 five previous depositions before your deposition</p> <p>18 here today. And I'll just tick them off and then</p> <p>19 ask you if there are any others.</p> <p>20 I have an indication that you gave two</p> <p>21 depositions in the NC versus Hain case in</p> <p>22 California state court, one in December 2021 and</p> <p>23 one in April of 2023. Does that sound correct?</p> <p>24 A. I don't remember exactly how many. That</p> <p>25 sounds farther in the past than I would have</p>                    |
| <p style="text-align: right;">Page 11</p> <p>1 guessed, but I don't know exactly when the dates</p> <p>2 were. I don't know if it's exactly -- if it's two</p> <p>3 or one or three.</p> <p>4 Q. And I know that it's been a while since</p> <p>5 you were deposed in that case, but does it seem</p> <p>6 accurate that you gave two depositions in the</p> <p>7 case?</p> <p>8 A. Yeah. So there was a -- was it the Sargon</p> <p>9 hearing? I don't know if that counts.</p> <p>10 Q. Well, I was going to come to that in a</p> <p>11 minute. I was just asking you about depositions</p> <p>12 right now.</p> <p>13 A. I don't recall exactly how many there</p> <p>14 were. Two sounds fair.</p> <p>15 Q. Okay. I have noted that you gave a</p> <p>16 deposition in a case called In Re Plum Baby Food</p> <p>17 Litigation in Northern California federal court.</p> <p>18 Does that sound fair?</p> <p>19 A. Is that -- there's a class action? Yeah.</p> <p>20 I think I've given a few on the class action at</p> <p>21 this point.</p> <p>22 I know there was one in person. There was</p> <p>23 one on Zoom. So I can -- I think that the one in</p> <p>24 person was the class action. I think there have</p> <p>25 been at least two.</p>                             | <p style="text-align: right;">Page 12</p> <p>1 Q. Okay. Also indication that you've given a</p> <p>2 deposition in Abbott Infant Formula Products</p> <p>3 Liability Litigation. Do you remember that?</p> <p>4 A. Maybe that was the one that was in person.</p> <p>5 Maybe I'm getting confused. Maybe the Plum was on</p> <p>6 Zoom and the Abbott one was in person, now that</p> <p>7 you say that.</p> <p>8 Q. Do you recall the subject of your</p> <p>9 testimony in the Abbott infant formula case?</p> <p>10 A. They've all been about heavy metals in</p> <p>11 baby food products.</p> <p>12 Q. Or in that case, it was infant formula?</p> <p>13 A. Yeah. Sorry. I was including infant</p> <p>14 formula in my characterization of baby foods.</p> <p>15 Q. And then I know in March of this year,</p> <p>16 March 6th, 2025, you gave a deposition in the</p> <p>17 Landon R. case in California state court. Do you</p> <p>18 recall that?</p> <p>19 A. Yes. Here. That was the one that was</p> <p>20 here.</p> <p>21 Q. You're talking about here at the DLA --</p> <p>22 A. In this room.</p> <p>23 Q. I'm sorry. We're talking over each other.</p> <p>24 You had given a deposition in the</p> <p>25 Landon R. case in this exact location in</p> |

|   |  |
|---|--|
| <p style="text-align: right;">Page 13</p> <p>1 March 2025. Is that correct?</p> <p>2 A. That is correct.</p> <p>3 Q. And we're talking about the DLA office</p> <p>4 here in Boston?</p> <p>5 A. Yes.</p> <p>6 Q. Do you live in Boston?</p> <p>7 A. I live in the suburbs of Boston.</p> <p>8 Q. Which suburb?</p> <p>9 A. I live in Medfield, Massachusetts.</p> <p>10 Q. Okay. Do you recall any other depositions</p> <p>11 you've given other than the ones we've just</p> <p>12 enumerated?</p> <p>13 A. There was a -- I had a little deposition</p> <p>14 for a private matter in probably 2019 regarding a</p> <p>15 sort of, like, real estate land dispute in my</p> <p>16 neighborhood.</p> <p>17 Q. That's the only other one that you have</p> <p>18 given?</p> <p>19 A. I don't remember exactly. Like, I can't</p> <p>20 say for sure that your counts were correct, but I</p> <p>21 can't think of any other ones, off the top of my</p> <p>22 head.</p> <p>23 Q. And let me go back because a minute ago</p> <p>24 you mentioned about testifying at a Sargon hearing</p> <p>25 in the NC case, I believe.</p>  | <p style="text-align: right;">Page 14</p> <p>1 A. I think it was that case.</p> <p>2 Q. And that was a baby foods case. Correct?</p> <p>3 A. That is correct.</p> <p>4 Q. You testified remotely in that?</p> <p>5 A. I did.</p> <p>6 Q. As opposed to being actually in court.</p> <p>7 Correct?</p> <p>8 A. That is correct.</p> <p>9 Q. And that was just testimony with the</p> <p>10 lawyers and the judge involved? There was no jury</p> <p>11 involved in that?</p> <p>12 A. I don't recall there being a jury.</p> <p>13 Q. Have you ever given testimony in a</p> <p>14 courtroom where there was a jury?</p> <p>15 A. I have never given testimony in a</p> <p>16 courtroom with a jury.</p> <p>17 Q. Okay.</p> <p>18 MR. KLATT: Let's mark as the first</p> <p>19 exhibit to your deposition. If we could mark this</p> <p>20 as Exhibit Number 1.</p> <p>21 (Exhibit 1 marked for identification)</p> <p>22 MR. KLATT: Pedram, it's just the notice.</p> <p>23 A. I was scared you were going to have some</p> <p>24 proof that somehow I had been in a court with a</p> <p>25 jury. I was curious to see how bad my memory</p>     |
| <p style="text-align: right;">Page 15</p> <p>1 really was.</p> <p>2 MR. ESFANDIARY: The crux of the case.</p> <p>3 Q. I didn't think you had, but I just wanted</p> <p>4 to make sure.</p> <p>5 A. No.</p> <p>6 Q. We're showing you what's been marked as</p> <p>7 Exhibit Number 1 to your deposition, Dr. Gardener,</p> <p>8 and it's "Defendants' Notice of Deposition of</p> <p>9 Hannah Gardener, Sc.D. and Request for Production</p> <p>10 of Documents."</p> <p>11 Have you seen Exhibit 1 before you came</p> <p>12 here today?</p> <p>13 A. Sorry. I need to get acquainted.</p> <p>14 Q. Sure.</p> <p>15 A. Is this something from the past, from --</p> <p>16 Q. No. This is something that was served in</p> <p>17 this case -- just turn to the back -- just a</p> <p>18 couple of weeks ago, on July 14th.</p> <p>19 I gather you haven't seen that before</p> <p>20 today?</p> <p>21 A. I think I have, but I figured I -- the</p> <p>22 most responsible thing would be to read it.</p> <p>23 Q. I'll just represent to you if you've seen</p> <p>24 it, it is the notice. There's nothing new there.</p> <p>25 MR. KLATT: Pedram, let's go off the</p> | <p style="text-align: right;">Page 16</p> <p>1 record if she's going to take some time to review</p> <p>2 that.</p> <p>3 MR. ESFANDIARY: Sure.</p> <p>4 THE VIDEOGRAPHER: We're off the record,</p> <p>5 9:19 a.m.</p> <p>6 (Off the record, 9:19 a.m. to 9:20 a.m.)</p> <p>7 THE VIDEOGRAPHER: Back on the record,</p> <p>8 9:20 a.m. Please proceed.</p> <p>9 BY MR. KLATT:</p> <p>10 Q. So, Dr. Gardener, I think during our brief</p> <p>11 break off the record you established you have seen</p> <p>12 Exhibit Number 1 before today. Correct?</p> <p>13 A. I believe so. Like I said when we were</p> <p>14 off the record, I thought more recently than</p> <p>15 July 14th. I haven't taken the time to read it</p> <p>16 all, so I can't verify that it's different from</p> <p>17 what I'm familiar with.</p> <p>18 Q. When you reviewed it previously, did you</p> <p>19 identify any documents you had that were</p> <p>20 responsive to the notice?</p> <p>21 A. Yes.</p> <p>22 Q. Did you bring any of those with you today?</p> <p>23 A. No.</p> <p>24 Q. What did you identify that was responsive</p> <p>25 to the notice?</p> |

1 MR. ESFANDIARY: Without disclosing  
2 attorney ex parte communications.

3 Q. Whenever I ask you a question today, I'm  
4 not asking you for the substance of any  
5 communications you've had with the plaintiff's  
6 attorney. I might ask you who you've talked to,  
7 but I won't ask you the substance.

8 If you would, identify what materials you  
9 have that are responsive to Exhibit Number 1.

10 A. Sure. So in response to this, I sent my  
11 CV to my lawyer. I expect they sent it to you.

12 Q. Yes. We'll mark that in a minute.

13 Go ahead.

14 A. And then I asked questions about --

15 MR. ESFANDIARY: Don't reveal any  
16 communications with attorneys.

17 Q. Other than your CV, did you have materials  
18 responsive to the request in Exhibit 1?

19 A. No. I mean, I'm a professor of  
20 biostatistics. There was a request for, like,  
21 anything I've ever done about biostatistics, which  
22 would be, like, too vast and unreasonable to  
23 provide everything I've ever discussed about  
24 biostatistics. I discuss it every single day in  
25 my career for 18 years. But I had nothing to

1 produce that was related to this case.

2 Q. All right. Well, let's go to the actual  
3 page Number 4 in Exhibit Number 1. And you'll see  
4 Request For Production No. 1, it doesn't ask you  
5 for anything you've ever written. It asked you  
6 for your file in this case, including published  
7 and unpublished literature.

8 Do you have such a file?

9 A. I don't know what you mean by "file."

10 Q. Do you have any materials relating to this  
11 case?

12 A. Sure.

13 Q. Okay. So that would be your file.

14 And where do you keep that?

15 A. On my computer.

16 Q. Okay. Did you bring that with you today?

17 A. I did not.

18 Q. Okay. Look at Request No. 2, "All  
19 document(s) setting forth or referring to, in  
20 whole or in part, the data or other information"  
21 you considered "to prepare your opinions in this  
22 case."

23 Do you have such documents?

24 A. Yes. There's a long list of, like,  
25 reference material that I have sort of added over

1 the years. And my understanding is that the  
2 lawyers in this case have a long record of that  
3 and have shared that with you.

4 Q. Okay. Let's look at Request No. 4, "All  
5 document(s) reflecting unpublished data, including  
6 but not limited to your own data reviewed by or  
7 relied upon by you to provide the opinions offered  
8 in this case."

9 Do you have any such unpublished data?

10 A. I have no unpublished data related to  
11 opinions in this case that -- that formed my  
12 opinions in this case.

13 Years ago I published a paper on heavy  
14 metal contamination in baby food that -- we  
15 published it on lead and cadmium, but we also did  
16 analyze data on arsenic and mercury.

17 So I guess that would be -- I have  
18 knowledge of contamination of baby food with  
19 arsenic from that work.

20 Q. And you said you published a paper  
21 resulting from that?

22 A. That is correct.

23 Q. And did you conclude in that paper that  
24 arsenic in baby food caused autism?

25 A. So in that paper we did not include

1 arsenic. So in that paper we included cadmium and  
2 lead. We did not publish our findings for arsenic  
3 and mercury.

4 Q. Did you conclude in that paper that any  
5 heavy metal caused autism, ASD, autism spectrum  
6 disorder or ADHD?

7 A. So in that paper we were looking at heavy  
8 metal contamination in baby food. We studied -- I  
9 can't remember how many samples. It was like  
10 between over a hundred, I want to say, different  
11 baby food samples.

12 We measured the contamination in those  
13 baby food samples with lead and cadmium. There  
14 were no people in that study, so there were no --  
15 there were no children, there were no adults. We  
16 were looking at the extent of contamination of  
17 that baby food with lead and cadmium.

18 We also did analyze arsenic and mercury,  
19 but we did not publish the results for arsenic and  
20 mercury.

21 So I do have that data on arsenic and  
22 mercury, actually probably on an old computer  
23 because now that was really a long time ago that  
24 we analyzed that data.

25 Q. So in answer to my question, you did not

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1 conclude in that published paper that lead,  
2 cadmium, arsenic, or mercury caused autism, autism  
3 spectrum disorder or attention deficit  
4 hyperactivity disorder. Correct?

5 A. That paper was not related to that. That  
6 paper was all about how heavily contaminated baby  
7 food is with lead and cadmium.

8 Q. And you didn't draw any conclusions about  
9 the health outcomes as a result of that, in that  
10 paper. Correct?

11 A. I'd have to look at the paper. I'm  
12 assuming you have it. But in terms of what we  
13 wrote in the discussion, I don't recall our  
14 discussion in -- what we wrote in the discussion  
15 about the implications of that high level of  
16 contamination.

17 Q. Let's -- just so we're clear today, let's  
18 get a few terms defined.

19 If I use "ASD," can we agree I'm referring  
20 to autism spectrum disorder?

21 A. Yes, I understand that.

22 Q. If I say "ADHD," we're referring to  
23 attention deficit hyperactivity disorder?

24 A. Yes, I understand that.

25 Q. Let's continue looking at Exhibit

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1 Number 1, Request 5, "All document(s)  
2 constituting, setting forth, referring to, in  
3 whole or in part, exhibits to be used as a summary  
4 or support for your opinions, which you prepared."

5 Do you have any such thing?

6 A. "All documents constituting, setting  
7 forth, or referring to, in whole or in part,  
8 exhibits" -- that's a mouthful of a sentence for a  
9 nonlawyer -- "exhibits to be used as a summary of  
10 or support of your opinions."

11 Meaning, like, the papers?

12 Q. Whatever --

13 A. I guess I don't know what the question is  
14 here.

15 Q. Have you created any exhibits to be used  
16 as part of your opinions or testimony in the case?

17 A. I'm not exactly sure exactly what  
18 constitutes an exhibit, but I created a report.  
19 And that report --

20 MR. KLATT: Let's mark that.

21 (Exhibit 2 marked for identification)

22 Q. Do you recognize what we've marked as  
23 Exhibit 2, Dr. Gardener?

24 MR. ESFANDIARY: Do you have a copy for  
25 me, Mike?

Page 23

1 MR. KLATT: You know what, I don't. I'm  
2 sorry.

3 MR. ESFANDIARY: I can bust out my  
4 computer here.

5 A. This looks like my report.

6 Q. Your report in this case, in the baby food  
7 MDL?

8 A. Yes.

9 Q. And I believe the date of that report is  
10 May 23rd, 2025. Is that correct?

11 A. That is correct. That's on here.

12 Q. I know you prepared reports in previous  
13 baby food cases, in the NC case and in the  
14 Landon R. case. Do you remember those reports?

15 A. Yes. And it's really hard for me to keep  
16 them all, like, which one is which. But there's  
17 also -- I've prepared reports on heavy metal  
18 contamination in class action lawsuits as well.

19 Q. I'm specifically asking about the cases in  
20 which it's alleged that heavy metals caused or  
21 contributed to ASD or ADHD.

22 And my understanding is you've written  
23 reports in the NC case, in the Landon R. case, and  
24 in this case, the baby food MDL. Is that correct?

25 A. That is correct. But also in multiple

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1 class action lawsuits. Those are broader in terms  
2 of my responsibility wasn't just ASD and ADHD but  
3 also other outcomes. But ASD and ADHD were in  
4 those reports. That's why I think it's probably  
5 most responsible for me to include those as well.

6 Q. Did you -- do you recall needing to go  
7 back and correct anything that you wrote in your  
8 report either in the NC case or in the Landon R.  
9 case?

10 A. Yeah. There was one sentence that I  
11 needed to, like -- there was a sentence that  
12 didn't sound right. I don't remember exactly what  
13 sentence it was. I corrected it at one of the  
14 depositions. Like, the sentence didn't make  
15 sense. It's correct in here.

16 But other than that, I don't recall any  
17 other corrections nor do I remember what sentence  
18 it was.

19 Q. Do you remember whether that was in the NC  
20 or the Landon R. case?

21 A. Actually, now that I am thinking about it,  
22 I corrected it in the deposition that was taken by  
23 Zoom, which would have been in one of the class  
24 action cases.

25 But actually, I think that sentence had



Page 25

1 been in -- so I don't think -- maybe it was never  
2 actually corrected on the record. It was, like --  
3 it was supposed to say "do not" and it was -- it  
4 was like a sentence that didn't make sense.

5 But now that I think about it, that  
6 sentence might have actually been in the  
7 earlier -- in the earlier reports, but the  
8 correction was made in the class action lawsuit.

9 But there was some overlap between, you  
10 know -- I copied and pasted some things that  
11 applied because in the class action lawsuits I  
12 talk about sort of the broad health effects of the  
13 contamination of baby food with heavy metal.

14 So in sections where I talked about ASD  
15 and ADHD, I didn't reinvent the wheel; I copied  
16 and pasted. So I think that sentence might have  
17 been in one of the earlier reports.

18 Q. So as we sit here today, is there anything  
19 else that you can recall from either the NC report  
20 you wrote or the Landon R. report you wrote that  
21 you would want to correct or change today?

22 A. Not that I can think of.

23 Q. Okay.

24 MR. KLATT: Let's mark the next exhibit.  
25 (Exhibit 3 marked for identification)

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1 Q. The court reporter has handed you what  
2 we've marked as Exhibit Number 3. Dr. Gardener,  
3 do you see that?

4 A. Yes, I do.

5 Q. And what is Exhibit Number 3?

6 A. It looks like my reference list.

7 Q. And it's also -- if you look at the cover  
8 page, it says "Rebuttal Expert Report of Hannah  
9 Gardener." Correct?

10 A. Yes.

11 Q. And it's dated July 15th, 2025, just a  
12 little over two weeks ago. Correct?

13 A. Correct.

14 Q. What's your understanding of the purpose  
15 of your writing a rebuttal report in the case?

16 A. So, like, the rebuttal was indicating that  
17 I had not -- that none of my opinions were changed  
18 after seeing some slight -- slightly different  
19 estimates from the toxicologists in this case  
20 about the levels of lead and arsenic in  
21 hypothetical menus of baby foods related to this  
22 case.

23 Q. You're referring to menus for which  
24 Dr. Jones calculated heavy metal levels. Is that  
25 correct?

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1 A. That is correct.

2 Q. Do you know Dr. Jones personally?

3 A. I do not.

4 Q. Did you try to, yourself, verify any of  
5 the data that she reported?

6 A. I did not.

7 Q. You relied totally on her calculations.  
8 Is that correct?

9 A. I relied on her calculations for what they  
10 were, for the amount of arsenic and lead in these  
11 hypothetical baby food menus across different  
12 brands of baby food.

13 Q. So you don't know Dr. Jones personally.  
14 Correct?

15 A. I do not. I don't know anything about  
16 Dr. Jones. I've never met Dr. Jones.

17 Q. Do you know what Dr. Jones' field of  
18 expertise is?

19 A. My understanding -- I'm not even sure if  
20 Dr. Jones is a he or she. My understanding is  
21 that Dr. Jones is a toxicologist, and that is  
22 about all I know about Dr. Jones.

23 Q. Are you sure about her being a  
24 toxicologist?

25 A. I'm not even sure about the "her." I have

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1 been told that Dr. Jones is a toxicologist.

2 Q. And I'll represent to you as far as I know  
3 she is a woman as well. So you can assume that.

4 A. Okay. Then I'll refer to her as "she."

5 Q. Was there anything else that you intended  
6 to do with your rebuttal report other than just  
7 discuss the revised numbers that Dr. Jones  
8 provided?

9 A. No. That is all I did in my rebuttal  
10 report.

11 Q. And also attached to your rebuttal report  
12 is an updated materials considered list of  
13 Dr. Hannah Gardener. Do you see that?

14 A. Yes, I do.

15 Q. And is this the list you prepared and  
16 provided to attorneys?

17 A. I have not prepared this list --

18 Q. Okay.

19 A. -- and I have never provided it. What has  
20 happened is over time the lawyers in this case  
21 have really taken the responsibility for creating  
22 and maintaining this spreadsheet.

23 I basically -- my relationship with the  
24 lawyers in this case and in related cases has now  
25 been over several years. And every time I sort of



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1 write a report or work on this more, I increase  
2 the number of articles that I tell them that I  
3 have read and cited in the report that contribute  
4 to my opinions.

5 And they keep this list of everything that  
6 I have read.

7 Like, I cannot say for sure that there are  
8 things that I have read that are not in this list.  
9 There probably are, because I read things, you  
10 know, all the time that contribute to my general  
11 understanding of epidemiology and neurotoxicity,  
12 nor can I say that there's anything --

13 Q. I understand that. But what I'm asking  
14 you, when is the last time that you verified the  
15 accuracy of the updated materials considered list  
16 of Dr. Hannah Gardener that has been marked as  
17 part of Exhibit 3?

18 A. I have never, like, gone through this, you  
19 know, really carefully and made sure that it's  
20 super correct. I basically tell the lawyers,  
21 like, you know, iteratively throughout the whole  
22 process, these are all the papers that I have  
23 read. But I've never -- I don't have a  
24 spreadsheet to verify it off of.

25 Q. Have you gone back at any time to verify

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1 that, in fact, you've read every article that's  
2 listed in Exhibit 3?

3 A. If I did, I -- I mean, there are 556  
4 articles. So I can guarantee you that there are  
5 articles in this list that I have read, if I  
6 looked at it, I wouldn't recognize it.

7 A few days ago I was reading a paper and I  
8 was like, wow, this is a really great paper. And  
9 I looked up and I saw I was an author on it many  
10 years ago.

11 So as you can see, I have published, you  
12 know, over 140 papers. I read papers all day,  
13 every day. I cannot possibly remember every  
14 single paper I have read.

15 So I guarantee you if I saw a paper, if  
16 you handed me some of these papers, I wouldn't --  
17 it would be as if I was reading it anew. I  
18 wouldn't recall it easily.

19 Q. But are you representing to us that you  
20 have read and reviewed every paper listed in  
21 Exhibit 3 at some point in time?

22 A. Most likely. Like, you know, I can't  
23 say -- my understanding is that this is a list  
24 that the lawyers for the plaintiff --

25 THE WITNESS: Is that right?

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1 A. -- the lawyers for the plaintiff have  
2 accumulated based on what I have told them that I  
3 have read.

4 Is it possible that there's a paper that I  
5 read that I forgot over so many years to tell them  
6 about? Possibly. I don't actually think that  
7 there's any papers that they think I have read  
8 that I haven't actually read.

9 Q. But it's accurate, you haven't gone back  
10 through to verify that you've read every paper  
11 that you've listed in Exhibit 3. Correct?

12 A. That is correct. I don't have a list to  
13 compare it to. I have never done any -- spent any  
14 time systematically reviewing this list for its  
15 accuracy.

16 Q. Do you know whether you've ever removed  
17 any references that were in a previous materials  
18 considered list in --

19 A. Not that --

20 Q. I'm talking about either for the NC case,  
21 the Landon R. case or this case.

22 A. Not that I can recall ever seeing.

23 I think what you're asking is have I ever  
24 seen a list on here and said, "Oh, no, I haven't  
25 read that" and removed it. I can't recall doing

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1 that.

2 Q. Or that you read it but thought it's  
3 something you no longer rely on. Have you done  
4 that?

5 A. Well, I guess my understanding is that  
6 I -- it's hard to say what I rely on versus what I  
7 don't.

8 I feel like everything I've ever read in  
9 my brain is sort of in there when I'm creating  
10 this report.

11 And to be honest, the list is probably  
12 bigger if you think about the fact that when I  
13 think about these papers I think about them from a  
14 statistical standpoint. And so therefore, in  
15 doing that, I rely on textbooks from my years at  
16 Harvard. I rely on statistical papers that I read  
17 at Harvard and throughout my entire career.

18 Q. Understood.

19 MR. ESFANDIARY: Don't interrupt.

20 MR. KLATT: I just would like her to  
21 answer the question I asked.

22 MR. ESFANDIARY: I know. But, Mike, I  
23 think we have an agreement -- actually, it's on  
24 the record that you-all would stop interrupting  
25 witnesses.

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1 MR. KLATT: But we need responsive  
2 answers, in the interest of time.  
3 MR. ESFANDIARY: She's being responsive.  
4 MR. KLATT: Well, Pedram, my specific  
5 question was has she ever removed an article from  
6 the materials considered.  
7 MR. ESFANDIARY: She was in the middle of  
8 responding to that question.  
9 MR. KLATT: Talking about everything she's  
10 reviewed in her career.  
11 MR. ESFANDIARY: Yeah, because she is a  
12 scientist with a very long background.  
13 MR. KLATT: I understand. But let's -- my  
14 specific question --  
15 MR. ESFANDIARY: I know, I know.  
16 Mike, please don't interrupt me.  
17 You asked her a question and she was in  
18 the middle of responding to it and you interrupted  
19 her. So please stop doing that.  
20 And, Doctor, feel free to give complete  
21 answers.  
22 MR. KLATT: Complete but responsive  
23 answers. Yes.  
24 MR. ESFANDIARY: Go ahead and reask your  
25 question.

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1 my understanding is that everything that  
2 contributes that I have read about this topic I'm  
3 supposed to include in here.  
4 Some of those papers are not cited to. I  
5 think what you're saying is when you rely on them,  
6 are they cited to your report.  
7 My understanding is there are some papers  
8 in here that I have read, that I have considered,  
9 but they're not cited to in my report.  
10 In my report, the ones I have cited to  
11 would be the ones I relied on, I would say.  
12 Q. Let me follow up on a very specific  
13 question I have.  
14 In looking at these lists of materials  
15 considered, either whether it was in the NC case,  
16 the Landon R. case, or this case, have you ever  
17 looked and seen a reference in the list, one or  
18 more, that you say, "You know what, I don't rely  
19 on that anymore. I'm removing it from the list."  
20 That's my very specific question.  
21 MR. ESFANDIARY: Objection. I think --  
22 Q. Not what you did rely on. Whether there's  
23 something that you identified and removed that you  
24 no longer rely on.  
25 MR. ESFANDIARY: Objection. I think the

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1 BY MR. KLATT:  
2 Q. Let me reask my question. It's a very  
3 specific question. Do you recall ever removing an  
4 article from either this materials considered list  
5 or a previous materials considered list in either  
6 the NC or the Landon R. case?  
7 MR. ESFANDIARY: You can answer again.  
8 A. So I apologize, I thought that was  
9 actually two questions ago, and I thought I had  
10 answered that. And then I thought there was a new  
11 question on the record that I was answering.  
12 Q. Can you answer this one?  
13 A. Yes. So going back to that question, like  
14 I said before, I don't recall ever seeing a paper  
15 in this list either now or in the past and saying,  
16 "Oh, wait, I haven't -- I didn't actually read  
17 that" and removing it. I don't recall ever doing  
18 it.  
19 Q. And you also don't recall going back and  
20 saying, "Oh, I don't rely on that paper anymore so  
21 I'm going to take it off the list"?  
22 A. I think that was the second question that  
23 I thought was the answer.  
24 In creating this report, I relied on  
25 everything that I have read about this matter. So

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1 question has been asked and answered.  
2 But you can answer it again.  
3 A. I guess I'm not really clear, then, on  
4 sort of what the definition of "relied" -- I have  
5 to think about this.  
6 Q. Okay. I'll withdraw that question.  
7 MR. ESFANDIARY: Hold on. She was in the  
8 middle of responding to your question.  
9 Please go on.  
10 A. I don't even actually think that there's  
11 any papers that I cited that then I removed that  
12 citation in my report. So I can't think of an  
13 example of something where I was like, oh, this  
14 contributed to my understanding of this field of  
15 science and it no longer contributes to it.  
16 Like, I don't recall any example in terms  
17 of what you're asking about.  
18 Q. That's the answer to my question. Thank  
19 you.  
20 Let's go back to Exhibit 2, which is your  
21 report in this case. Correct?  
22 A. Yes. That's correct.  
23 Q. Did anyone assist you in writing this  
24 report?  
25 MR. ESFANDIARY: Objection to the extent

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| <p style="text-align: right;">Page 37</p> <p>1 it calls for attorney-expert communications.</p> <p>2 I would instruct you to not disclose</p> <p>3 those. But if you can testify independent of</p> <p>4 that, feel free to do so.</p> <p>5 A. The writing is mine, the opinions are all</p> <p>6 mine, but I have had help -- a lot of help over</p> <p>7 time in terms of formatting it.</p> <p>8 Like the format, the required formats have</p> <p>9 changed between cases. There have been sort of</p> <p>10 suggestions in terms of -- I guess the word is</p> <p>11 "formatting," where to put things, how to</p> <p>12 structure it.</p> <p>13 Like, there have been changes, I guess,</p> <p>14 over time in terms of how the charges have been</p> <p>15 communicated to me, so my writing has been</p> <p>16 responsive to that.</p> <p>17 Q. Excluding any communications with</p> <p>18 attorneys, has anyone else other than you assisted</p> <p>19 you in writing your report in this case?</p> <p>20 A. No. Like, I haven't used any research</p> <p>21 assistants or, you know, any other people.</p> <p>22 Q. You exactly anticipated my question. So</p> <p>23 you have not used any research assistant, fellow,</p> <p>24 graduate student, anyone else to assist you in</p> <p>25 writing the report. Is that correct?</p> | <p style="text-align: right;">Page 38</p> <p>1 A. That is correct. I have not.</p> <p>2 MR. KLATT: Let's mark the next exhibit.</p> <p>3 (Exhibit 4 marked for identification)</p> <p>4 Q. A minute ago you mentioned, Dr. Gardener,</p> <p>5 that you had provided the attorneys with an</p> <p>6 updated CV. And this is what we were provided</p> <p>7 recently.</p> <p>8 Is that what you were referring to, what</p> <p>9 we've marked now as Exhibit 4, your CV?</p> <p>10 A. Yes. This is my updated CV that I sent</p> <p>11 them last week, I think.</p> <p>12 Q. When did you update it?</p> <p>13 A. I updated it last week.</p> <p>14 Q. Do you recall what you added?</p> <p>15 A. Yup. So I can't be sure all the things I</p> <p>16 added. The one that I had -- I think what they</p> <p>17 had sent you, a CV from March, I want to say, was</p> <p>18 the last time I had sent them a CV. And that was</p> <p>19 before I was promoted to associate professor, so</p> <p>20 my new CV reflects that big promotion.</p> <p>21 I'm constantly publishing. So my updated</p> <p>22 CV reflects publications that are in PubMed since</p> <p>23 March. My updated CV, I had a presentation this</p> <p>24 week at the Alzheimer's Association International</p> <p>25 Conference. I had other -- I actually had a few</p> |
| <p style="text-align: right;">Page 39</p> <p>1 presentations at this meeting this week, at the</p> <p>2 AAIC.</p> <p>3 I had some abstracts presented at an AHA</p> <p>4 meeting in March. I had a bunch of -- from</p> <p>5 February -- actually, those ones probably had</p> <p>6 already been in there.</p> <p>7 The American Academy of Neurology meeting</p> <p>8 was in April. I included the abstract that I</p> <p>9 presented there.</p> <p>10 Q. What was that abstract on?</p> <p>11 A. Outcomes of reperfusion therapies for</p> <p>12 acute ischemic stroke in patients with preexisting</p> <p>13 dementia.</p> <p>14 Q. It's true that you've written a fair</p> <p>15 amount on stroke. Correct?</p> <p>16 A. Yes.</p> <p>17 Q. In terms of the presentations that you've</p> <p>18 made to, I think you said, the American Academy of</p> <p>19 Neurology. Correct?</p> <p>20 A. Yes.</p> <p>21 Q. You mentioned the AHA. What is that?</p> <p>22 A. The American Heart Association, which is</p> <p>23 also the American Stroke Association.</p> <p>24 Q. And AAIC, what is that?</p> <p>25 A. That's the Alzheimer's Association</p>  | <p style="text-align: right;">Page 40</p> <p>1 International Conference. It's going on this</p> <p>2 whole week.</p> <p>3 Q. Would it be accurate to say that in 2025</p> <p>4 you've made no presentations to any scientific</p> <p>5 organization regarding heavy metals and autism or</p> <p>6 ADHD?</p> <p>7 A. I definitely haven't done any</p> <p>8 presentations this year about autism or ADHD. I</p> <p>9 don't recall any about lead or arsenic either.</p> <p>10 Q. In terms of the scientific presentations</p> <p>11 you've made this year, do they deal with any</p> <p>12 subjects other than Alzheimer's or stroke?</p> <p>13 A. Yes.</p> <p>14 Q. What?</p> <p>15 A. So I've done a lot of presenting about</p> <p>16 PFAS, per- and polyfluoroalkyl substances.</p> <p>17 Q. And what, specifically, subject were you</p> <p>18 addressing with those presentations?</p> <p>19 A. The need for more research on them, study</p> <p>20 on them, mostly in relation to dementia but really</p> <p>21 in relation to neurological consequences of them</p> <p>22 in general.</p> <p>23 Q. Can infants and children be exposed to</p> <p>24 those substances?</p> <p>25 A. Yes.</p>  |

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| <p style="text-align: right;">Page 41</p> <p>1 Q. Can they have neurocognitive harm to</p> <p>2 children and infants?</p> <p>3 A. From PFAS?</p> <p>4 Q. Yes.</p> <p>5 A. Yes.</p> <p>6 MR. ESFANDIARY: Belated objection. That</p> <p>7 calls for an undisclosed opinion.</p> <p>8 Q. Do you believe that PFAS can cause or</p> <p>9 contribute to autism or ADHD in children?</p> <p>10 MR. ESFANDIARY: Objection, beyond the</p> <p>11 scope of Dr. Gardener's expert testimony in this</p> <p>12 case and calls for an unsolicited opinion.</p> <p>13 Q. I'm just asking your expert opinion as</p> <p>14 someone who has presented in the field.</p> <p>15 MR. ESFANDIARY: That's beyond the scope</p> <p>16 of what she's here to talk about.</p> <p>17 But if you have an opinion.</p> <p>18 MR. KLATT: She can answer.</p> <p>19 A. I haven't delved into that literature</p> <p>20 fully, really. My grant and my work is focused on</p> <p>21 late-life cognitive impairment due to PFAS. And</p> <p>22 actually, the study population that I'm working in</p> <p>23 was largely not even exposed when they were very</p> <p>24 young.</p> <p>25 Q. Based on what you know about PFAS, in your</p> | <p style="text-align: right;">Page 42</p> <p>1 professional activities, do you entertain the</p> <p>2 possibility that they may cause or contribute to</p> <p>3 autism or ADHD in children?</p> <p>4 MR. ESFANDIARY: Objection, it calls for</p> <p>5 an undisclosed opinion beyond the scope of</p> <p>6 Dr. Gardener's expert report and opinions in this</p> <p>7 case.</p> <p>8 A. So I want to take a minute and say that I</p> <p>9 gave an oath at the beginning, starting this</p> <p>10 morning, that -- and I take that really seriously</p> <p>11 in terms of talking here about things that I am</p> <p>12 very confident based on my -- what I have read and</p> <p>13 prepared for today.</p> <p>14 And I don't want to be providing opinions</p> <p>15 on matters that I can't confidently provide that</p> <p>16 oath for. I did not come here today prepared to</p> <p>17 talk about PFAS in relation to autism and ADHD.</p> <p>18 I probably could give that oath today,</p> <p>19 talking about PFAS and dementia.</p> <p>20 You know, I didn't come here necessarily</p> <p>21 prepared to do that, but I have so much sort of</p> <p>22 very recent expertise in that that if you wanted</p> <p>23 to ask me questions about PFAS in relation to</p> <p>24 late-life cognitive decline, I would feel</p> <p>25 confident, the way I feel confident here talking</p> |
| <p style="text-align: right;">Page 43</p> <p>1 about lead and arsenic in relation to ASD and</p> <p>2 ADHD.</p> <p>3 But I am not prepared to provide any sort</p> <p>4 of reliable opinions under oath about PFAS and</p> <p>5 ADHD.</p> <p>6 Q. You hold yourself out as an expert in diet</p> <p>7 and other environmental causes of neurologic</p> <p>8 diseases. Correct?</p> <p>9 A. I do.</p> <p>10 Q. So I understand that with respect to</p> <p>11 different subjects you may be at different places</p> <p>12 along the continuum of scientific knowledge and</p> <p>13 confidence.</p> <p>14 But as someone who purports to be an</p> <p>15 expert in that field, are you at least</p> <p>16 entertaining the hypothesis as a scientist that</p> <p>17 PFAS might cause or contribute to autism or ADHD?</p> <p>18 MR. ESFANDIARY: Objection.</p> <p>19 This has gone as far as it should. I'm</p> <p>20 going to instruct you not to answer that question.</p> <p>21 MR. KLATT: That's not --</p> <p>22 MR. ESFANDIARY: Take it up with Corley.</p> <p>23 MR. KLATT: I'm sorry?</p> <p>24 MR. ESFANDIARY: Take it up with Judge</p> <p>25 Corley.</p>   | <p style="text-align: right;">Page 44</p> <p>1 MR. KLATT: I will.</p> <p>2 Q. I'm not asking you to disclose any</p> <p>3 litigation opinions. I'm asking you to disclose</p> <p>4 hypotheses, thoughts, concepts that you'd</p> <p>5 entertained as a scientist who has worked in the</p> <p>6 field.</p> <p>7 Have you entertained the hypothesis, as a</p> <p>8 scientist who's an expert on diet and other</p> <p>9 environmental causes for neurologic diseases, that</p> <p>10 PFAS might potentially cause ASD or ADHD in young</p> <p>11 children and infants?</p> <p>12 MR. ESFANDIARY: Objection, beyond the</p> <p>13 scope of Dr. Gardener's expert report and</p> <p>14 testimony in this case.</p> <p>15 I instruct you not to answer that</p> <p>16 question.</p> <p>17 MR. KLATT: We'll have to go to the judge</p> <p>18 on this and come back.</p> <p>19 MR. ESFANDIARY: Go for it.</p> <p>20 MR. KLATT: All right. What's your -- are</p> <p>21 you basing that instruction on some sort of</p> <p>22 privilege?</p> <p>23 MR. ESFANDIARY: No. It's the federal</p> <p>24 rules of procedure on expert testimony.</p> <p>25 MR. KLATT: That's not a basis for</p>  |

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1 instructing a witness not to answer.  
 2 MR. ESFANDIARY: Do you want to interrupt  
 3 me or do you want to let me answer your question?  
 4 MR. KLATT: I'll interrupt you to say  
 5 that's not a basis under the federal rules, but  
 6 you can go ahead and state your objection.  
 7 MR. ESFANDIARY: I just want to make sure  
 8 we get something straight on the record. You  
 9 don't interrupt me and I don't interrupt you at  
 10 all. Let's get that one straight. So when I'm  
 11 speaking, afford me the --  
 12 MR. KLATT: Say what you're going to say.  
 13 MR. ESFANDIARY: You just did it again.  
 14 Afford me the respect of finishing  
 15 responding to your question.  
 16 I'm basing that objection and instruction  
 17 not to answer on the Federal Rules of Civil  
 18 Procedure that dictate an expert's deposition  
 19 testimony shall be limited to the topics on which  
 20 they have been disclosed.  
 21 There's ample case law on this in the  
 22 Northern District of California and other  
 23 jurisdictions.  
 24 If you want to move to compel on that,  
 25 feel free to do so. I'm going to maintain my

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1 A. It looks like the book chapter that I was  
 2 invited to write was published around 2014.  
 3 Q. Have you published anything about autism  
 4 or ASD since 2014?  
 5 A. Not that I can recall, off the top of my  
 6 head.  
 7 Q. Let's talk about ADHD. Have you ever  
 8 published anything on ADHD?  
 9 A. Not that I can recall, off the top of my  
 10 head.  
 11 Q. Have you ever made a presentation to any  
 12 scientific organization or body on autism or ASD?  
 13 A. Yes, definitely on autism.  
 14 Q. And when and where was that?  
 15 A. So I've given multiple presentations early  
 16 on in my career about autism to the department of  
 17 pediatrics at the University of Miami, I think to  
 18 the department of endocrinology at the University  
 19 of Miami.  
 20 Q. When would that have been, Dr. Gardener?  
 21 A. I can probably find it. That was early in  
 22 my career, so that would have been in 2008, maybe  
 23 2009 too. I don't have all of these -- I don't  
 24 have every talk that I've ever given.  
 25 Q. Where are you looking?

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1 objection and instruction to the witness.  
 2 MR. KLATT: It's a totally inappropriate  
 3 and invalid objection, and you know it, and you're  
 4 just obstructing the deposition.  
 5 MR. ESFANDIARY: Okay. I disagree, but go  
 6 ahead.  
 7 MR. KLATT: Why don't we take a short  
 8 break, if that's all right.  
 9 MR. ESFANDIARY: Sure.  
 10 THE VIDEOGRAPHER: This concludes Media  
 11 Number 1. Going off the record, 9:58 a.m.  
 12 (Recess, 9:58 a.m. to 10:10 a.m.)  
 13 THE VIDEOGRAPHER: This is the beginning  
 14 of Media Number 2. Going back on the record,  
 15 10:10 a.m.  
 16 BY MR. KLATT:  
 17 Q. If we could return to your CV that you  
 18 recently provided.  
 19 A. Yes. Exhibit 4.  
 20 Q. Exhibit 4. Thank you.  
 21 I know you said a minute ago that you  
 22 previously published on the subject of autism.  
 23 A. Yes.  
 24 Q. When is the last time you have published  
 25 work on autism or ASD?

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1 A. Under "Selected Invited Talks."  
 2 Q. What page is that on Exhibit 4?  
 3 A. Pages -- that was listed on page 26.  
 4 Q. And what on page 26 were you referring to?  
 5 A. So near the top, right above "Teaching,"  
 6 "Prenatal, perinatal, and neonatal risk factors  
 7 for autism, University of Miami, department of  
 8 pediatrics, September 2008."  
 9 Q. So that was 17 years ago. Correct?  
 10 A. That is correct.  
 11 Q. Have you made any presentation on autism  
 12 since 2008 to any scientific or educational body?  
 13 A. I don't recall. I don't think so.  
 14 Q. What about for ADHD? Have you made any  
 15 presentation to any scientific or educational body  
 16 since -- or at any time ever, really, about ADHD?  
 17 A. A presentation? Not that I recall.  
 18 Q. You teach at the University of Miami, but  
 19 you live in Boston. Is that correct?  
 20 A. That is correct.  
 21 Q. Do you ever go to Miami to teach classes  
 22 in person or do you do it all remotely from  
 23 Boston?  
 24 A. So I teach a biostatistics class and it's  
 25 on Zoom. We offered to have some lectures in

1 person, and students like it by Zoom.

2 Q. Do you ever teach classes in person?

3 A. I provide lectures in person. But the  
4 class that I teach and the sort of class, like,  
5 invited lecturers for formal classes are all on  
6 Zoom these days.

7 Q. Okay. And how long has that been the  
8 case?

9 A. On Zoom? Since the pandemic.

10 Q. Prior to the pandemic, did you go teach  
11 courses at the University of Miami in person?

12 A. So I had planned to -- before I moved back  
13 to Boston, I sort of had planned to do a class and  
14 then I moved back to Boston.

15 And it wasn't really until the pandemic  
16 and, you know, how everything turned to Zoom that  
17 we were able to sort of see how I could teach  
18 biostatistics.

19 Q. When you said "when we moved back to  
20 Boston," were you moving from Miami?

21 A. That is correct. I used to live in Miami.

22 Q. What years did you live in Miami?

23 A. I lived in Miami until I moved, towards  
24 the end of 2012.

25 Q. To Boston?

1 A. Or mid 2012, to Boston.

2 Q. And how long had you lived in Miami up to  
3 that time?

4 A. About six years. Six or seven years.

5 Q. And what was it that took you to Miami in  
6 the first place?

7 A. My ex-husband's job was -- when I was  
8 still in grad school, so we sort of moved there.  
9 But I was still at Harvard, so I was sort of going  
10 back and forth for a year.

11 Q. When you finished grad school, you then  
12 moved permanently to Miami. Is that correct?

13 A. Well, the last year of grad school -- grad  
14 school was four years. The last year of grad  
15 school I would say I was in Miami just as much as  
16 I was in Boston.

17 I was doing teaching assistant work, but  
18 all of my research -- like, my classes had all  
19 been finished. So the only really reason I needed  
20 to be in Boston was to be a teaching assistant to  
21 meet with professors.

22 So I would say that last year of grad  
23 school I was probably in Miami just as much as I  
24 was in Boston. And then I got a postdoc at the  
25 University of Miami.

1 Q. What year are you referring to that you  
2 were finishing up here in Boston and moving to  
3 Miami?

4 A. I believe that was 2007.

5 Q. So you were in Miami basically from 2007  
6 through 2012 and then moved back to Boston. Is  
7 that correct?

8 A. Well, I guess it was 2006. I guess 2006  
9 was when I really started living in Miami just as  
10 much as living at my parents' house in Boston.

11 I sort of didn't really have a home. My  
12 ex-husband was in Miami, my parents in Boston, and  
13 I was sort of going back and forth doing my last  
14 year.

15 And then it was 2007 that I defended and  
16 graduated and started my job, my postdoc at the  
17 University of Miami. I think that was September  
18 of 2007, and then it was 2012 that I moved back to  
19 Boston.

20 Q. Between 2007 and 2012, did you ever teach  
21 any regular classes at the University of Miami?

22 A. They asked me to. We talked about it.  
23 But I was sort of fully funded with research and  
24 with training in my department.

25 So in terms of, like, was I teaching?

1 Yes. I had all these residents and young doctors  
2 who I was training in terms of, like, epi methods,  
3 biostatistics. But I wasn't teaching a formal  
4 class like I have been for the past several years.

5 Q. Okay. When is the first time in your  
6 career you started teaching a formal class?

7 A. Well, I was a teaching assistant when I  
8 was at Harvard. That was -- those were formal  
9 classes. There were several of them. And then it  
10 was 2001 or -- they probably started talking to me  
11 about it in 2001, but I can't remember when I  
12 started teaching, whether it was 2001 or 2002.  
13 I'm sorry. 2021, 2022.

14 Q. I was going to -- I was a little confused  
15 there. So let me make sure I understand on the  
16 record.

17 You started teaching a formal class in  
18 biostatistics for the first time in about 2020,  
19 2021 at the University of Miami?

20 A. I think it was 2021 or 2022, around there.  
21 I think this past year was my -- it was either my  
22 fourth or fifth year teaching this class.

23 Q. And that was the first time you'd actually  
24 taught a formal class since graduate school.  
25 Correct?



1 A. That is correct. I had done, like,  
2 lecturing in other people's classes, which is very  
3 common. And I had done a lot of teaching in terms  
4 of, like, training residents, early career  
5 physicians, about research methods, how to do --  
6 more like mentorship, which we in the university  
7 setting consider teaching.

8 Q. But I'm referring to what you called  
9 formal classroom teaching. That began in 2020,  
10 2021 up to now. Correct?

11 A. You know, it's on my CV, so I can --

12 Q. Great. Even better.

13 A. So it looks like the first class started  
14 it would have been January of 2022. So all the  
15 prep was in 2021.

16 Q. And that class is biostatistics?

17 A. It is called statistical methods for  
18 clinical and translational research. It is both  
19 epidemiology and biostatistics.

20 Q. Okay. Other than that class, have you  
21 done any other formal classroom teaching at the  
22 University of Miami?

23 A. I'll give, like, guest lectures. In terms  
24 of formal teaching, we -- so I'm the director of  
25 the biostatistics core for the Florida Stroke

1 Registry. And we have a community health worker  
2 course that we teach for -- to teach community  
3 health workers about stroke. And I teach the  
4 epidemiology section on that class.

5 Q. Okay. And you teach along with some other  
6 instructors who do other aspects of the class?

7 A. Yup. So mostly physicians, physical  
8 therapists. Other people teach the other topics.

9 Q. You said a few minutes ago that you'd been  
10 promoted to research assistant professor at the  
11 University of Miami, and I think you indicated  
12 that on your most recent CV. Is that correct?

13 A. No, that's not correct.

14 Q. Okay. Then tell me where I'm wrong.

15 A. I was promoted to research associate  
16 professor.

17 Q. Oh, I'm sorry. Yes.

18 A. I had been research assistant professor  
19 and now I'm associate.

20 Q. I went on the department of neurology at  
21 the University of Miami Miller School of Medicine  
22 website, and I see that there are a number of  
23 people in the department who are described as  
24 assistant professors or associate professors and a  
25 then few others, a smaller number are called

1 either research assistant professors or research  
2 associate professors.

3 Can you explain for us what the difference  
4 is between a research associate professor and just  
5 an associate professor in the department of  
6 neurology at the University of Miami Miller School  
7 of Medicine?

8 A. I thought you were going to ask why I am  
9 not even either of those, why I'm listed as a  
10 scientist. And that was just because I haven't  
11 updated my page there in forever.

12 So it sounds like I'm appropriately listed  
13 as a research associate professor.

14 So some people are clinical. So I'm not a  
15 physician. I don't see patients. So my job in  
16 the -- I'm not a neurologist. I'm an  
17 epidemiologist, so I do research. I'm not a  
18 clinician.

19 Q. Meaning you don't see and diagnose  
20 patients with neurological illnesses. Correct?

21 A. Correct. I'm not a clinician. I'm not in  
22 the hospital. I'm not in the clinical setting.

23 And there are people who may do that but  
24 still their sort of primary role is research. My  
25 expertise is as an epidemiologist in the

1 department.

2 Q. And you're an Sc.D., not an MD. Correct?

3 A. That is correct. I have a doctorate of  
4 science.

5 Q. And so therefore, it would be accurate to  
6 say, following from what you just testified,  
7 you've never diagnosed an infant or a child with  
8 ASD, autism, or attention deficit hyperactivity  
9 disorder. Correct?

10 A. That is correct. I don't do any  
11 diagnosing, any sort of treating or diagnosing.  
12 I'm not a clinician. I don't have patients.

13 Q. Focusing on Exhibit 4 again, your most  
14 recent CV, the one dated July 2025. You have it  
15 there in front of you?

16 A. I do.

17 Q. You say your current academic rank is  
18 research associate professor.

19 So does the denomination or term "research  
20 associate professor" indicate that you're not  
21 clinical? I'm trying to understand the  
22 distinction between a research associate professor  
23 and a simple associate professor within the  
24 department of neurology at the University of  
25 Miami.

1 What's the distinction between research  
2 associate and just associate?

3 A. That's a very good question. I'm not  
4 actually sure. I was really excited to be  
5 promoted. I don't actually know about those  
6 distinctions.

7 Q. Is the research associate professor a  
8 tenure track position?

9 A. I am not -- I am not tenured, if that's --  
10 yeah. And maybe I will be one day, maybe not.

11 Q. Do you understand currently that you're on  
12 a tenure track?

13 A. It sounds like you're telling me I'm on a  
14 tenure track.

15 Q. I'm just asking you if that's your  
16 understanding.

17 A. It sounds like you're my boss and, you are  
18 on a tenure track.

19 I haven't paid that much attention to it.  
20 It's not like it's a supreme goal of mine. I have  
21 a lot of confidence and security.

22 Whether I get formal tenure one day or  
23 not, I haven't paid that much attention to that.

24 Q. Who is your supervisor or superior at the  
25 University of Miami Miller School of Medicine that

1 you report to?

2 A. So I have several. There's a department  
3 chair who I work very, very closely with.

4 Q. Who is that?

5 A. His name is Jose Romano.

6 Q. Who else?

7 A. And then there's the vice chair of  
8 research, which is -- I would say she's probably  
9 my main person that I report to, that I interact  
10 with. Her name is Tatjana Rundek.

11 Q. R-U-N-D-E-K?

12 A. Oh, her name? I was like, am I in DEK?  
13 R-U-N -- I was like I don't even --

14 Q. I was trying to spell her name.

15 A. R-U-N-D-E-K.

16 Q. Anyone else that you report to or consider  
17 your supervisor there?

18 A. The chair of my department for many, many  
19 years tragically passed away a couple of years  
20 ago. And I would have had him -- added him to the  
21 list. He was our department chair forever.

22 Q. Who was that?

23 A. Ralph Sacco. He was the president of the  
24 American Academy of Neurology, he was the  
25 president of the American Heart Association, and

1 he was also the chair of our department.

2 And he was my mentor. He was the person  
3 who hired me. And really just a really great  
4 leader of our department. I would have added --  
5 he died just very recently.

6 Q. Did Dr. Sacco or has Dr. Rundek or  
7 Dr. Romano ever told you, Dr. Gardener, you're on  
8 a tenure track here at the University of Miami, so  
9 keep up the good work, or something along those  
10 lines?

11 A. They tell me keep up the fabulous work all  
12 the time. They have been, you know, my  
13 cheerleaders and just an unbelievable support  
14 system from Day 1.

15 Q. What have they told you about tenure  
16 track?

17 MR. ESFANDIARY: Before you answer that  
18 question, there's someone waiting in the waiting  
19 room. Can you let them in, please? Steve Brady.  
20 Thank you so much.

21 I'm sorry. Please continue.

22 A. Have I had conversations with Tatjana?

23 I mean, she wants me to go very far in my  
24 career, up to the top. You know, I don't recall  
25 the specifics of our conversation. I don't have,

1 like, a timeline. Like, I'm not in the process of  
2 applying for tenure. That's not . . .

3 Q. I understand. And Dr. Sacco and  
4 Dr. Romano and Dr. Rundek have never told you  
5 specifically, Dr. Gardener, you're on a tenure  
6 track here in Miami. Correct?

7 A. I guess they've never said those words.

8 Q. Okay.

9 A. We probably have talked about sort of  
10 timelines of when. To me, it feels -- I mean, I  
11 just got promoted this year to research associate  
12 professor, which was actually -- I guess we had  
13 conversations when I moved to Boston. We had  
14 conversations about when can I get back to Miami.

15 At the time, modern-day life with Zoom and  
16 my ability to be a director in the department, to  
17 be a leader and all the things that are going on  
18 in my career right now felt inconceivable living  
19 far away.

20 I mean, when I moved to Boston in 2012,  
21 nobody -- there was no faculty that were -- that  
22 was remote. They felt really desperate that I was  
23 leaving.

24 We weren't actually sure if I would be  
25 moving back to Miami. And they said we would love

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1 to try this whole remote thing. It was really  
 2 unprecedented. Now it's not at all unprecedented.  
 3 There are other faculty that work remotely, of  
 4 course.  
 5 So I went to this scientist track. The  
 6 ability to -- part of being a professor is  
 7 providing service to the university and to the  
 8 department.  
 9 And prior to the pandemic we couldn't  
 10 figure out how I could do all the service  
 11 components. That was sort of the stumbling block  
 12 for many years in terms of my promotion, how could  
 13 I provide service to the department, to the  
 14 university, if I lived all the way in Boston and I  
 15 couldn't come as frequently as they wanted me to  
 16 come.  
 17 Once the pandemic hit and all of our, you  
 18 know, committee meetings and leadership meetings  
 19 are on Zoom, now that's much more conceivable.  
 20 So we talked more about what this move  
 21 would mean in terms of my trajectory back in 2012  
 22 than we are now in 2025.  
 23 Q. So you're in your 13th year at Miami.  
 24 Correct?  
 25 A. No. I'm in my 18th year. Remember I

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1 started in 2007.  
 2 Q. I'm sorry. You're right.  
 3 But going back to the question I asked  
 4 you, and I think before the lengthy answer you may  
 5 have answered it, but Dr. Sacco, Dr. Romano, and  
 6 Dr. Rundek have never said the words  
 7 "Dr. Gardener, you're on the tenure track."  
 8 Correct?  
 9 A. I don't know if they've ever said those  
 10 words.  
 11 Q. You don't recall, as you sit here today?  
 12 A. No. Like saying that sentence, I don't  
 13 recall.  
 14 Q. Okay.  
 15 A. I guess what's most pertinent is that it's  
 16 not like this is something I'm actively working  
 17 towards or something that's impossible now that I  
 18 am remote. It takes some time and process.  
 19 MR. KLATT: Object to the  
 20 nonresponsiveness and move to strike everything  
 21 beginning with "I guess."  
 22 Let's mark this as the next exhibit.  
 23 (Exhibit 5 marked for identification)  
 24 A. Do you want me to answer that question  
 25 again?

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1 Q. No. That's just an objection I need to  
 2 make sometimes for the record.  
 3 A. Okay.  
 4 MR. ESFANDIARY: What number is this, 5?  
 5 MR. KLATT: Exhibit 5, I believe.  
 6 Q. Dr. Gardener --  
 7 MR. KLATT: That's what I said.  
 8 MR. ESFANDIARY: Their experts are being  
 9 paid more.  
 10 Q. Dr. Gardener, we're looking at what we  
 11 marked as Exhibit 5, which was provided to us.  
 12 Did you prepare Exhibit 5, this "Summary  
 13 of Invoices for the Expert Services of Dr. Hannah  
 14 Gardener"?  
 15 A. I did not.  
 16 Q. So you didn't prepare Exhibit 5. Correct?  
 17 A. I did not. It's very exciting to me. It  
 18 doesn't quite feel real, but I'm not at the same  
 19 time formally doubting it by any means on the  
 20 record.  
 21 Q. So I assume this relates to work you've  
 22 done on baby food litigation. Is that correct?  
 23 Referring to Exhibit 5.  
 24 A. This says "Summary of Invoices for the  
 25 Expert Services of Dr. Hannah Gardener."

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1 So I guess maybe you tell me. I'm not  
 2 exactly sure what this is.  
 3 Q. Have you never seen it before?  
 4 A. I have never seen it before, as evidenced  
 5 by my reaction. It was like, "Whoa."  
 6 Q. It was provided to us by your attorney, so  
 7 that's why I'm asking you about it.  
 8 A. Okay.  
 9 Q. Do you think that Exhibit 5 is incorrect  
 10 in any respect?  
 11 A. Not necessarily. I did not prepare this.  
 12 I have no reason to say it's either correct or  
 13 incorrect. I can't verify it, and I don't know  
 14 what it encompasses.  
 15 Like you said, there have been many cases.  
 16 I don't know what this is inclusive of or  
 17 exclusive of.  
 18 Q. Do you know whether Exhibit 5 includes  
 19 invoices for what you refer to as the baby food  
 20 class actions or does Exhibit 5 only refer to the  
 21 baby food cases specifically alleging ASD and ADHD  
 22 that you've been involved in?  
 23 A. I have no idea.  
 24 Q. Okay. Let's look at the very first line.  
 25 And it looks like the first invoice begins

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1 on March 11th, 2021, a little over four years ago.  
 2 Does that sound right to you about the time you  
 3 first got involved in baby food litigation?

4 A. No. Because the first payment would have  
 5 been for a retainer.

6 Q. Okay. And what amount was the retainer?

7 A. Probably \$5,000.

8 Q. Do you recall when that was paid?

9 A. Nope. But my guess is that typically --  
 10 and maybe this isn't -- maybe I didn't do that  
 11 back then. But typically there would have been a  
 12 \$5,000 retainer.

13 So this is a summary of invoices, so I  
 14 guess I would not have invoiced for a retainer.

15 Q. You wouldn't do that?

16 A. I don't think I've ever invoiced for a  
 17 retainer.

18 Q. Do you require a retainer in all cases in  
 19 which you consult with attorneys?

20 A. There could have been some early cases  
 21 where I wasn't doing that yet. But certainly  
 22 since 2021, I would have asked for a retainer.  
 23 But I've never sent an invoice for a retainer.

24 Q. And do you bill against the retainer?

25 A. So I do a retainer billed against the last

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1 invoice. So I guess I'll subtract that one from  
 2 the last one.

3 So I guess it makes sense if this was the  
 4 invoices that it wouldn't because I've never  
 5 invoiced just for that first initial payment. It  
 6 will come off of something.

7 Q. I'm looking at the last line before the  
 8 total.

9 A. Yup.

10 Q. The line on Exhibit 5, the summary of  
 11 invoices where the date is December 23rd, 2024 to  
 12 March 6th, 2025 and the amount is \$85,615. Do you  
 13 see that, Dr. Gardener?

14 A. I do.

15 Q. Do you know what that amount that was  
 16 billed for time between December 23rd, 2025 and  
 17 March 6th, 2025 was for?

18 A. I think it was -- well, considering the  
 19 fact that this -- that Exhibit 2, the date was  
 20 May 23rd, is that this would have -- this would  
 21 have covered a lot of the preparation for this  
 22 report.

23 Are you asking what I did for --

24 Q. Exactly. I'm asking what you did between  
 25 December 23rd, 2024 and March 6th, 2025, which, by

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1 the way, was the date of your deposition in the  
 2 Landon R. case, I believe, for which you billed  
 3 \$85,615.

4 A. That's very helpful. That anchors it  
 5 because I was trying to figure it out.

6 So yeah, that would have been for the  
 7 deposition of the Landon R. It would have been  
 8 for all the preparation and reports leading up to  
 9 that.

10 Q. You wrote both an original report and a  
 11 rebuttal report in the Landon R. case. Correct?

12 A. I don't recall. But if I did, that  
 13 probably would have -- I guess the rebuttal would  
 14 have been before the deposition so it would have  
 15 included the rebuttal too.

16 Q. Your hourly rate is \$650 an hour?

17 A. That is correct. But it's \$700 an hour  
 18 for deposition.

19 Q. Oh, it is? Has it always been more for  
 20 depositions?

21 A. No.

22 Q. When did you make that change?

23 A. I don't recall.

24 Q. Do you recall if you charged \$700 an hour  
 25 for your Landon R. deposition in March of this

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1 year?

2 A. I don't recall exactly. I might have.

3 Q. When were you contacted about this case?  
 4 And when I say "this case," I'm referring to the  
 5 baby foods MDL for which you wrote your May 23rd,  
 6 2025 report.

7 A. I have no idea. They all sort of bleed  
 8 together and there is often an overlap.

9 So when I first got the email about this  
 10 one, honestly, I have no idea.

11 Q. Do you have any reason to dispute that  
 12 you've been paid \$323,688 so far in baby food  
 13 litigation?

14 A. I can't confirm or deny it. I didn't  
 15 create this.

16 Q. Does that sound like a reasonable amount?

17 A. Honestly, based on my reaction when I was  
 18 like, "Whoa." I mean, I know the transcript can't  
 19 reflect how much my eyes bulged.

20 If you had asked me 15 minutes ago to  
 21 guess, I would not have guessed that number.

22 Q. You would have guessed a larger or smaller  
 23 number?

24 A. I probably would have guessed a smaller  
 25 number. But children are expensive. So it

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1 doesn't shock me.

2 Q. What do you mean by "children are  
3 expensive"?

4 A. I guess that, like -- I'm like, wow, I  
5 spent a lot of money. You know, camp and college  
6 and dance and basketball. Yeah.

7 So I guess I would not have expected that.  
8 Yeah. I don't have a bank account with that money  
9 just sitting there for me to have seen it so  
10 readily.

11 Q. How do you keep track of the time you  
12 spend on baby food litigation?

13 A. Notes. Like a spreadsheet or notes of the  
14 time and what I'm doing and the date.

15 Q. So let's say you spend two hours composing  
16 a report. On the spreadsheet you'll enter the  
17 date, you'll enter two hours and something like  
18 "drafting report." Is that how you keep track?

19 A. Yeah. I don't know if you've seen my  
20 invoices. I know they have been produced in other  
21 depositions.

22 But what I'll do is I'll say the date,  
23 I'll say the number of hours to the tenth of an  
24 hour -- yeah, tenth of an hour -- and I'll say  
25 broadly "literature review" or "writing the

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1 deposition" or "writing a rebuttal" or "email with  
2 the lawyers" or "a conversation with the lawyers"  
3 and the hourly rate for that activity multiplied  
4 by the time spent, how much that day cost. And I  
5 do it by the day, and I add them up.

6 Q. Going back to your testimony about \$650 an  
7 hour for your work, is that for everything that  
8 you do except testimony?

9 A. It would be for the trial. So, like, the  
10 slight increase in rate is for depositions and for  
11 trial too.

12 Q. You're talking about actual testimony,  
13 deposition or trial testimony?

14 A. Deposition or being at -- yeah. I guess I  
15 don't really understand your question.

16 Q. You just went through a number of  
17 activities you did: writing reports, talking with  
18 attorneys, emailing, reviewing things. I think  
19 for all those activities, my understanding is you  
20 charge \$650 an hour. Correct?

21 A. That is correct.

22 Q. Then if you have to testify either in a  
23 deposition like today or in court, you charge \$700  
24 an hour. Correct?

25 A. That is correct.

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1 Q. And you don't recall exactly when you made  
2 that switch. Correct?

3 A. I don't. It wasn't in 2021, but it has  
4 been subsequent to that.

5 Q. Okay. So other than those two rate  
6 levels, \$650 an hour, \$700, do you charge any  
7 other hourly rate for any other activity relating  
8 to baby food cases?

9 A. Right now, no.

10 Q. Approximately -- and I realize you might  
11 not have the records in front of you, but  
12 approximately how much time in hours have you  
13 spent on baby food litigation, including writing  
14 your report in this case, your rebuttal report,  
15 getting ready for this deposition, beginning,  
16 let's say, right after March 6th, 2025 when you  
17 gave your Landon R. deposition up to today as we  
18 sit here, July 31st, 2025?

19 So in that time period, what's your best  
20 estimate of the number of hours you've spent on  
21 baby food litigation?

22 A. I don't know. I haven't counted it up.  
23 Not even like a rough -- like, I haven't --

24 Q. Have you kept track of it somewhere?

25 A. I have.

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1 Q. On this spreadsheet you referred to?

2 A. Yes.

3 Q. Okay. Can you just look back at that for  
4 us and just report to us when you get the  
5 transcript the number of hours you spent, just  
6 number of hours you spent between March 6th, 2025  
7 and today, July 31st, 2025?

8 MR. ESFANDIARY: Before you answer that  
9 question, you can submit that to us separately.

10 MR. KLATT: Do you have any objection to  
11 providing that number?

12 MR. ESFANDIARY: I don't think so, but I  
13 think the understanding we've had and what we've  
14 received from you guys is a summary of invoices  
15 that we've received throughout the course of  
16 litigation. We did the same thing in the Landon  
17 case. But we can talk offline.

18 MR. KLATT: I'm just trying to get an  
19 update in addition to the information contained  
20 on --

21 MR. ESFANDIARY: If we could get the same  
22 thing from your guys, then sure. But if not, then  
23 no.

24 MR. KLATT: I'm sure that will be worked  
25 out.



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1 BY MR. KLATT:

2 Q. As we sit here today, obviously you've  
3 spent probably some significant amount of time  
4 writing your report that we've marked as  
5 Exhibit 2, writing your rebuttal report,  
6 Exhibit 3, preparing for the deposition today,  
7 since March 6th. Correct?

8 A. That is correct.

9 Q. Can you even estimate for me, would it be  
10 more or less than 100 hours?

11 A. Oh, I don't think it would be more than  
12 100 hours.

13 Q. Can you estimate -- and again, I'm not  
14 going to hold you to it. Can you estimate whether  
15 it would be more or less than 50 hours?

16 A. I don't think it's -- I don't know. I  
17 shouldn't surmise.

18 Q. What did you do exactly to prepare to give  
19 this deposition today?

20 A. I read my report a couple times. I had  
21 two brief conversations with Pedram. What else  
22 did I do? I read some papers over again. My  
23 guess is -- I don't know -- 12 or so. 12, 15,  
24 maybe.

25 Q. 12 to 15 articles?

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1 A. Yeah.

2 Q. Your report that we've marked as, what?  
3 Exhibit 2, I believe, is over 100 pages long.  
4 Correct?

5 A. That is correct.

6 Q. You said you've read that report several  
7 times since you finished it. Correct?

8 A. That is correct. I have not read every  
9 single page. For example, I did not -- every time  
10 I read it I don't, you know, review, for example,  
11 my qualifications. I skipped to around page 17.

12 Q. How long does it take for you to review  
13 from page 17 to the conclusion of the report?

14 A. I'm not sure exactly.

15 Q. Would it be hours?

16 A. It would take over an hour. Absolutely.

17 Q. Having read through your report that we've  
18 marked as Exhibit 2 several times since you  
19 finished it, May 23rd, 2025, have you seen  
20 anything in there that you want to correct?

21 A. I've seen typos. I've seen a couple  
22 typos.

23 Q. Other than typos, have you seen anything  
24 substantive that you'd want to correct in your  
25 report that we've marked as Exhibit 2?

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1 A. No, I haven't found anything substantive.

2 Q. And you said you had a couple of  
3 conversations with Mr. Esfandiary before the  
4 deposition. Is that correct?

5 A. That is correct.

6 Q. Were those in person or via some other  
7 communication method?

8 A. We had one conversation on Zoom and one  
9 just on the phone.

10 Q. So only two conversations regarding this  
11 deposition?

12 A. That is correct.

13 Q. And approximately how long did each of  
14 those last?

15 A. I want to say our conversation was about  
16 15 minutes on the phone, and the Zoom maybe an  
17 hour.

18 Q. And when did those take place?

19 A. We had a conversation yesterday and we had  
20 a Zoom maybe two weeks ago.

21 Q. Since you prepared your report in this  
22 case on May 23rd, 2025, have you had conversations  
23 with any other attorneys regarding baby food  
24 litigation other than the two you've had with  
25 Mr. Esfandiary?

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1 A. Yup. Yes. I had a conversation with his  
2 colleague Holly. And I think all of the  
3 conversations that I've had have included Holly,  
4 but there might have been other people on some of  
5 the -- now I'm, like, doubting did I even -- I did  
6 have two conversations with Pedram.

7 I've definitely had conversations with  
8 someone named Holly. Oh, I had conversations with  
9 Holly in relation to --

10 MR. ESFANDIARY: Don't disclose content.

11 Q. Don't give me the substance. Well, it was  
12 in relation to baby food litigation. Correct?

13 A. Yup. Yes.

14 Q. And how many conversations have you had  
15 with Holly?

16 A. I think two.

17 Q. And what was the communication method? In  
18 person? Zoom?

19 A. There was one on the phone and one on  
20 Zoom.

21 Q. When did those take place?

22 A. I mean, I shouldn't say -- I'm not  
23 positive about any of this.

24 Q. I understand.

25 A. I've had a lot of conversations with a lot



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1 of people, so I could be incorrect about some of  
2 these things. I just want to say that.

3 I keep very good records. I just have not  
4 memorized what those are.

5 Now I forget even what -- the question was  
6 the method?

7 Q. Yeah. How did you communicate in these  
8 conversations that you had with Holly?

9 A. I know I've had at least one Zoom with  
10 Holly and one phone conversation with Holly, I'm  
11 pretty sure.

12 Q. Other than Pedram or Holly, have you  
13 communicated with any other attorneys regarding  
14 baby food litigation since writing your May 23rd,  
15 2025 report?

16 A. There were definitely other lawyers or a  
17 other lawyer on at least one of the Holly Zooms,  
18 but I don't remember what that person's name --  
19 I'm really bad with names. I can picture her, but  
20 I don't know her name.

21 Q. You don't know Holly's last name?

22 A. Oh, Holly's last name? That wasn't what I  
23 was referring to.

24 Q. You're referring to someone else?

25 A. Yeah. But also, I can't actually tell you

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1 that I have seen any of the attorneys in person.  
2 I just can't recall, like, how many Zooms or how  
3 many phone calls. I just --

4 Q. Do you know if any nonattorneys were  
5 present on any of these Zooms or phone calls?

6 A. I don't, like -- on the Zooms, I don't ask  
7 for people's credentials, so I don't know. I  
8 don't even know Pedram's credentials. I'm  
9 assuming he's an attorney.

10 Q. That may not be a valid assumption, so you  
11 better check that.

12 A. Bottom line, in any of these matters I've  
13 never asked when people have emailed me or I'm on  
14 the phone or on zoom, I don't ask for people's  
15 credentials.

16 Q. In addition to reading your report and the  
17 conversations you've referred to, you said you'd  
18 read some papers, maybe as many as a dozen, in  
19 preparation for your deposition. Do you recall  
20 which papers those were?

21 A. I can't tell you, off the top of my head.  
22 No. I'm really bad with names.

23 Q. Why did you select those approximately  
24 dozen papers to review before the deposition?

25 MR. ESFANDIARY: Without disclosing the

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1 what Holly's last name is. Holly is probably  
2 listening and is horrified.

3 Q. Is Holly an attorney?

4 A. Yes, Holly is an attorney.

5 Q. Do you know if she is with Wisner Baum,  
6 Mr. Esfandiary's firm, or some other firm?

7 A. I am not positive.

8 I'm sorry, Holly.

9 Q. To the best of your estimation, since your  
10 report, May 23rd, 2025, in this case, that we've  
11 marked as Exhibit 2, you have had approximately  
12 four phone conversations with attorneys in the  
13 baby food litigation?

14 A. Oh, since March 6th? Is that what you're  
15 asking?

16 Q. I actually was referring to your report,  
17 the May 23rd date. Let's move it back to  
18 March 6th.

19 Since March 6th, 2025, can you estimate  
20 how many conversations you've had with attorneys  
21 either in person or via Zoom or other  
22 communication method regarding baby food  
23 litigation?

24 A. I haven't had any meetings in person.  
25 This is the first time since my last deposition

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1 substance of any communications with counsel.

2 A. I mean, you know, I guess I don't know how  
3 to answer that, then.

4 Q. So other than attorneys bringing certain  
5 articles to your attention or asking you to review  
6 them, did you choose to review any articles  
7 yourself to prepare for today's deposition?

8 A. No.

9 Q. In preparing for today's deposition, did  
10 you review any other documents other than your  
11 report of May 23rd, 2025 that we've marked as  
12 Exhibit 2 or these approximately dozen or so  
13 articles that you've referred to? Did you review  
14 any other written materials to prepare for your  
15 deposition?

16 A. To prepare for today? No. I have read  
17 other things. But if you're asking with the  
18 intent to prepare for today . . .

19 Q. What other things have you read?

20 A. I was sent some of the other expert  
21 reports from the other side. And I didn't have  
22 time to read the entirety of them, but I read some  
23 parts of those.

24 Q. And when did that happen?

25 A. Three weeks ago, four weeks ago.

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1 Q. Is that before you prepared your rebuttal  
2 report in the case?

3 A. I think so.

4 Q. In --

5 A. I'm not sure. It's hard to remember,  
6 like, what -- but it feels like -- when was my --

7 Q. I think your rebuttal report is dated  
8 July 15th, so it's a little over two weeks ago.

9 A. Yeah. I think I would have read those --  
10 where did that go? Oh, this one. Yeah. I think  
11 that would have been before then, I guess.

12 Q. In preparing for today's deposition, did  
13 you review any documents or articles that you had  
14 not reviewed before preparing your report, your  
15 May 23rd, 2025 report? Did you review any new  
16 articles relating to your opinions?

17 A. There was one new article that popped up  
18 yesterday.

19 Q. And do you know the author or the subject  
20 matter?

21 A. Yup. So the -- I'm pretty sure the  
22 person's name was Brown. It was a recently  
23 published article looking at lead levels in  
24 children who were autistic. And I have seen that.  
25 Probably -- yeah.

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1 Q. And I'm sorry if I just asked this, but do  
2 you recall the journal?

3 A. I do not.

4 Q. And what led you to find this article?

5 A. It popped up -- it's on one of my devices.

6 Q. Do you have some sort of dinger or alert  
7 system that you use to bring new articles to your  
8 attention?

9 A. I don't.

10 Q. So how is it that this popped up?

11 A. I don't actually remember how -- like how  
12 I found it. It must have been on PubMed. That  
13 was the only new thing that I saw.

14 I don't recall -- I actually don't  
15 remember when it was published. I know it was  
16 published in 2025. And then I scanned my report  
17 to see that if it was in there, and I think it was  
18 published since my report. But that did come up,  
19 so that was something I read yesterday.

20 Q. Did it change any opinions that you have  
21 in your report?

22 A. No. I have no corrections to be made to  
23 my report.

24 Q. Would you add it now to your materials  
25 considered list?

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1 Q. Do you recall, did you print out a copy or  
2 did you review it online?

3 A. I reviewed it online.

4 Q. What journal was it in?

5 A. I don't recall.

6 Q. And where were the -- was it children or  
7 adults? Where were the subjects of the study  
8 located?

9 A. In order to confidently say that, I'd have  
10 to find it. It was children.

11 Q. And you don't recall where they were  
12 located?

13 A. I do not recall, off the top of my head.

14 Q. Do you recall the results of the study?

15 A. My understanding was that it was -- I  
16 mean, I shouldn't surmise.

17 Q. I'm just asking for your best  
18 recollection.

19 A. It was a study just including kids who  
20 were autistic, I believe, and looking at their  
21 blood lead levels and looking at correlates of  
22 those blood lead levels. Basically making the  
23 argument that -- and so it was not in the United  
24 States, now that I'm saying I recall that, for  
25 more, like, widespread blood lead level screening.

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1 A. Yes, I would.

2 Q. Okay.

3 MR. KLATT: And again, we'd ask if she  
4 could supplement with that.

5 MR. ESFANDIARY: Sure.

6 A. I had meant to tell Pedram that I saw it  
7 and then I just forgot.

8 Q. Okay. Is it correct, Dr. Gardener, that  
9 you hold no other academic appointments other than  
10 at the University of Miami Miller School of  
11 Medicine?

12 A. That is correct. No other -- no other  
13 universities. I'm also -- I was just talking to  
14 the chair of the biostatistics department to get  
15 another -- to get -- she wanted me to have an  
16 appointment in her department too, but at no other  
17 universities.

18 Q. Okay. Has that appointment happened yet  
19 or is that just something under discussion?

20 A. I don't think so. I was just going to  
21 actually email her with my -- in relation to my  
22 promotion and say, you know, is it going to be in  
23 that department too? So I don't think so.

24 MR. KLATT: Let's mark this as an exhibit,  
25 if we can.

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1 (Exhibit 6 marked for identification)  
2 Q. Showing you something we've marked as  
3 Exhibit 6. And I'll represent to you,  
4 Dr. Gardener, this is from the University of Miami  
5 Miller School of Medicine, the John P. Hussman  
6 Institute for Human Genomics, the HIHG.  
7 Are you familiar with that institute?  
8 A. The HIHG, yes. I work with them a lot.  
9 Q. And it says, the title of this from their  
10 web page is, "Autism Spectrum Disorders or ASD."  
11 Do you see that?  
12 A. Yes.  
13 Q. And I want to see their description and  
14 see what you think about it.  
15 It says, "Autism is one of several  
16 conditions that fall under the general category of  
17 autism spectrum disorder or ASD."  
18 Do you agree with that?  
19 A. That's what it says. Yes.  
20 Q. And you agree with that?  
21 MR. ESFANDIARY: Objection. I think it's  
22 beyond the scope of her testimony.  
23 Go ahead.  
24 A. "Autism is one of several conditions that  
25 fall under the general category" . . .

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1 A. I do.  
2 Q. And do you have any reason to disagree  
3 with that?  
4 A. I don't.  
5 Q. And then it goes on to say, "Researchers  
6 at the John P. Hussman Institute for Human  
7 Genomics, the HIHG, are continuing to conduct  
8 studies to understand the genetic basis of autism  
9 and how these genes and genetic variants act to  
10 alter neuronal function leading to the behavioral  
11 characteristics seen in autism." Did I read that  
12 correctly?  
13 A. You did.  
14 Q. And do you agree with that?  
15 A. So I'm not involved in this research that  
16 they're doing.  
17 Q. You're not involved with the autism  
18 spectrum research that the John P. Hussman  
19 Institute for Human Genomics in Miami is doing?  
20 A. No.  
21 Q. What is your interaction with them?  
22 A. So I do a lot of work with people at the  
23 HIHG on genetics of stroke, dementia, subclinical  
24 vascular outcomes. So we look at the genetics of  
25 carotid atherosclerosis. We have looked at

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1 So I think you asked me earlier when we  
2 were talking about ASD, we were referring to  
3 autism. And so yes.  
4 Q. And then skipping on down, it says "Twin  
5 sibling and family studies have demonstrated a  
6 strong role for genetic factors underlying  
7 autism." Do you see that?  
8 A. I do.  
9 Q. Do you also agree with that yourself?  
10 A. I'm not here to opine about the role of  
11 genetics in autism, but I have stated in my report  
12 that there's a genetic contribution.  
13 Q. So you would agree with that statement  
14 from the Hussman Institute at the University of  
15 Miami. Correct?  
16 A. I mean, to the extent that it echoes --  
17 it's sort of a broad statement that echoes what  
18 I've said in my report, that there is a strong  
19 role for genetics in autism.  
20 Q. And then it continues, "Previous studies  
21 in large families and autism typical  
22 neurodeveloping populations have identified a  
23 large number of genes and genetic variants that  
24 are associated with the development of autism."  
25 Do you see that?

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1 genetics of carotid disease in general, some  
2 cardiac biomarkers. We've looking at genetics of  
3 life's essential 8. Right now the paper that I'm  
4 working on with them right now is looking at that.  
5 I just wrote a grant with them looking at  
6 genetics and the interaction of genetics and  
7 nonmedical drivers of health, what we used to call  
8 social determinants of health, but not in relation  
9 to autism. More in relation to neurovascular  
10 diseases, stroke, dementia, carotid arthro, MRI,  
11 white matter disease, things like that.  
12 Q. Have you ever had a grant looking at any  
13 aspect of autism or attention deficit disorder,  
14 ADHD?  
15 A. I have not. I take that back.  
16 So there may have been -- in my work at  
17 Harvard there may have been -- I don't think it  
18 was grant funded, but I don't -- looking back, my  
19 thesis, I don't recall the funding that provided  
20 support for, like, the professor that I was  
21 working with for that.  
22 Q. And when was your thesis?  
23 A. When did I graduate? When did I present  
24 my thesis?  
25 Q. Right.

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1 A. 2007.  
 2 Q. So about 18 years ago. Right?  
 3 A. That is correct. I've been an  
 4 epidemiologist for 18 years.  
 5 Q. You've referred to the Hussman  
 6 Institute -- and am I saying that correctly? Is  
 7 it Hussman?  
 8 A. Yeah. We call it the HIHG.  
 9 Q. The HIHG. You call it the HIHG as a  
 10 nickname?  
 11 A. It's the abbreviation that you see right  
 12 here.  
 13 Q. So looking further at Exhibit 6, down near  
 14 the bottom, "The HIHG says recent studies using  
 15 cutting-edge DNA sequencing technologies have  
 16 identified numerous genetic mutations that appear  
 17 to be involved in autism, suggesting that in most  
 18 cases rare variants in genes are driving  
 19 development of autism." Did you see that?  
 20 A. Yup.  
 21 Q. Do you have any reason to disagree with  
 22 that?  
 23 A. That it's rare variants versus other kinds  
 24 of variants?  
 25 Q. Correct.

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1 I can't say what they're hoping to do or -- I've  
 2 not been involved. I have no opinion.  
 3 Q. But you agree that genetic factors cause  
 4 autistic disorders. Correct?  
 5 MR. ESFANDIARY: Objection, misstates the  
 6 testimony.  
 7 Q. I'm just asking if you agree with that  
 8 statement.  
 9 A. So let me find -- in my report I talk  
 10 about the fact that absolutely there's a role for  
 11 genetics. In fact, I talk about the importance of  
 12 genetics in terms of the causal role of lead and  
 13 arsenic.  
 14 Q. I know you don't agree with this, but if  
 15 lead and arsenic were proven not to have a role in  
 16 autism, would you believe genetic factors still  
 17 were playing a role?  
 18 MR. ESFANDIARY: Objection, incomplete  
 19 hypothetical, calls for speculation.  
 20 A. That would depend on -- you're saying in  
 21 this hypothetical world where in 50 years we got  
 22 it all wrong about one thing, would we also  
 23 necessarily be getting it wrong on another thing?  
 24 Who knows?  
 25 Q. Do you believe that children who aren't

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1 A. I have not been involved in this research.  
 2 I am not here to opine about that, what kinds of  
 3 variants in genes, whether they're inherited or --  
 4 Q. Do you have an opinion about that?  
 5 A. I do not. Nope.  
 6 Q. And then it goes on to say, "The HIHG says  
 7 these rare variants tend to fall into classes of  
 8 genes that regulate neuronal function by altering  
 9 the balance between excitatory and inhibitory  
 10 signals in the brain."  
 11 Do you agree or disagree with that  
 12 statement or not have an opinion?  
 13 A. I don't have -- this is not work that I  
 14 have been involved in or that I'm prepared to talk  
 15 about.  
 16 Q. And the last sentence in Exhibit 6 from  
 17 the HIHG says, "By finding the genetic factors  
 18 that cause autistic disorders and understanding  
 19 how these factors alter brain cell function, HIHG  
 20 researchers hope to gain valuable insights into  
 21 how autism develops, with the goal of improving  
 22 diagnostic and treatment approaches."  
 23 Do you have any basis to agree or disagree  
 24 with that statement?  
 25 A. No. I've not been involved with this, so

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1 exposed to lead and arsenic can develop autism due  
 2 to genetic causes?  
 3 A. Show me a kid who's not been exposed to  
 4 lead and arsenic. It doesn't -- such a child does  
 5 not exist.  
 6 Q. So every child is exposed to lead and  
 7 arsenic?  
 8 A. Yes.  
 9 Q. And they're exposed to lead and arsenic  
 10 from a number of different sources. Correct?  
 11 A. That is correct.  
 12 Q. Is there a child in the world who's not  
 13 exposed to lead or arsenic?  
 14 MR. ESFANDIARY: Objection, calls for  
 15 speculation.  
 16 A. That's a hypothetical.  
 17 Q. Okay. But you would agree that the vast  
 18 majority of children in the United States and  
 19 around the world are all exposed to lead and  
 20 arsenic even before they're born. Correct?  
 21 MR. ESFANDIARY: Objection, overbroad,  
 22 calls for speculation.  
 23 A. I talked in my report just about how  
 24 significant the contamination of baby food is with  
 25 lead and arsenic and the fact that children are

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1 exposed throughout their entire -- throughout  
2 their entire lives.

3 I mean, you know, it's really hypothetical  
4 whether there's a child that exists somewhere.

5 Q. Well, let's talk about exposure to lead  
6 and arsenic other than what you believe is  
7 exposure via baby food.

8 Are babies exposed to lead and arsenic in  
9 the womb before they're born?

10 MR. ESFANDIARY: Objection, overbroad,  
11 calls for speculation and beyond the scope.

12 Q. That's not speculative at all, is it?

13 MR. ESFANDIARY: All kids at all times?

14 Q. You know that the vast majority of  
15 children are exposed to lead and arsenic while  
16 they're in the womb. Correct --

17 MR. ESFANDIARY: Objection --

18 Q. -- Dr. Gardener?

19 MR. ESFANDIARY: -- calls for speculation,  
20 overbroad.

21 A. Are you talking about from all the  
22 contaminated food or just in general?

23 Q. Well, just answer my question first.

24 Do you believe that unborn babies in their  
25 mother's wombs, in utero, are exposed to lead and

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1 arsenic?

2 MR. ESFANDIARY: Objection, incomplete  
3 hypothetical, calls for speculation, beyond the  
4 scope.

5 A. That's hypothetical whether there's a  
6 child out there that exists that isn't, you know,  
7 exposed to lead or arsenic. It's a hypothetical.  
8 These are pervasive exposures.

9 Q. So as pervasive exposures, all pregnant  
10 mothers are exposed to lead and arsenic before  
11 they get pregnant and while they're pregnant.  
12 Correct?

13 MR. ESFANDIARY: Objection, calls for  
14 speculation, overbroad, beyond the scope.

15 A. It depends. I guess theoretically there  
16 could be such a child.

17 Q. Well, wait a second. We're talking about  
18 mothers now. Almost all mothers -- and let's  
19 limit it to the United States. Virtually every  
20 mother in the United States during her lifetime is  
21 exposed to lead and arsenic. Correct?

22 MR. ESFANDIARY: Objection. One second.  
23 It calls for speculation, overbroad.

24 Q. It's not speculative at all, is it,  
25 Doctor?

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1 MR. ESFANDIARY: Beyond the scope.

2 A. I thought you were talking about the  
3 children of those mothers.

4 Q. We'll get to them in a minute. Let's talk  
5 about the mothers. Adult mothers in the United  
6 States are routinely exposed to lead and arsenic  
7 throughout their lifetimes. Correct?

8 MR. ESFANDIARY: Objection, calls for  
9 speculation, overbroad, beyond the scope.

10 A. You know, like, that is -- it's  
11 hypothetical. I can't say that every single, you  
12 know, mother is definitely exposed. I would  
13 expect, if not all, the vast majority are exposed  
14 to lead and arsenic during pregnancy, when they  
15 were children.

16 Q. As adults. Correct?

17 A. People are exposed to lead and arsenic as  
18 adults. Yes.

19 Q. As we sit here today, you and I are  
20 exposed to lead and arsenic in the air we breathe,  
21 in the water we drink, in the food we eat, and all  
22 sorts -- if we come into contact with dust and  
23 dirt. Correct?

24 MR. ESFANDIARY: Objection, calls for  
25 speculation, overbroad, beyond the scope.

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1 A. Yes, people are exposed, you know, in many  
2 ways. I talked about that in my report.

3 Q. And you understand that women -- men and  
4 women, but women in particular, can sequester  
5 heavy metals in their bones before they're  
6 pregnant. Correct?

7 MR. ESFANDIARY: Objection, beyond the  
8 scope.

9 A. Sequester?

10 Q. Yeah. You know heavy metals can be  
11 sequestered in bone in humans. Correct?

12 A. I never use the term "sequester."

13 Q. What term would you use?

14 A. "Accumulate."

15 Q. Sure. Great. You understand that lead  
16 and other heavy metals can be accumulated in adult  
17 human bone during the course of their lifetimes.  
18 Correct?

19 A. Yes.

20 Q. And you understand that pregnant women,  
21 because they have active bone turnover, can  
22 release lead and other heavy metals into their  
23 bloodstream which then expose their unborn child  
24 to it. Correct?

25 A. Yes.



1 Q. What are the levels of lead and other  
2 heavy metals that on average U.S. children are  
3 exposed to from their mothers while they're in the  
4 womb before they're born?

5 A. I don't have a statistic for that, off the  
6 top of my head.

7 Q. You don't have any level you could give me  
8 on average or median level?

9 A. That's what I thought you were asking  
10 about, the median level. No, I don't know that  
11 number, off the top of my head.

12 Q. But you do know that mothers release lead  
13 and other heavy metals from their bones into their  
14 bloodstream during pregnancy. Correct?

15 A. That is typically true.

16 Q. And you know that bone metabolism is  
17 particularly active during pregnancy and so you  
18 can have even increased release during pregnancy  
19 beyond what you would have when you're not  
20 pregnant. Correct?

21 A. I have not thoroughly reviewed the data on  
22 bone metabolism during pregnancy.

23 Q. Would you believe that if an unborn infant  
24 is exposed to lead and arsenic and other heavy  
25 metals in the womb before birth that that could be

1 a potential cause of autism and attention deficit  
2 disorder later in their lives?

3 MR. ESFANDIARY: Objection, calls for an  
4 undisclosed opinion, beyond the scope of the  
5 report, calls for speculation, incomplete  
6 hypothetical.

7 A. I mean, I did refer to the prenatal  
8 literature, to some extent. I would say it's less  
9 than the postnatal literature in relation to lead  
10 and arsenic in relation to ASD and ADHD.

11 But there is literature. It's beyond the  
12 scope of this because we're talking about  
13 postnatal exposure, but I did rely on the prenatal  
14 exposure to some extent in forming these opinions.

15 And I'm happy to read those sections of my  
16 report.

17 Q. Mr. Esfandiary can have you do that in his  
18 time if he wants to. I'm just asking you, you  
19 believe that children can develop autism due to  
20 exposure to lead and other heavy metals prenatally  
21 while they're in the womb. Correct?

22 MR. ESFANDIARY: Objection, beyond the  
23 scope of her expert testimony in this case, calls  
24 for speculation, overbroad.

25 A. I can say there are studies that have

1 related prenatal exposure to arsenic and lead in  
2 relation to autism, but I haven't done the -- like  
3 the thorough literature review and analysis to  
4 opine about that to the same degree.

5 My charges are related to postnatal  
6 exposure. I've brought in some information about  
7 prenatal because it did help inform my opinion.  
8 But I haven't done the -- I haven't scrutinized  
9 that literature to add that to my opinions. It  
10 wasn't part of my charge.

11 Q. Well, unrelated to your charge, I'm  
12 talking to you as an epidemiologist, as a  
13 scientist who's a self-professed expert in diet  
14 and other environmental causes of neurologic  
15 disease.

16 You believe that prenatal exposure to  
17 lead, arsenic or other -- and other heavy metals  
18 to an unborn infant while they're still in the  
19 womb can cause autism or ADHD. Correct?

20 MR. ESFANDIARY: Objection, beyond the  
21 scope of her expert opinions in this case, asked  
22 and answered, calls for speculation.

23 You can answer it again.

24 A. So I want to remind you that I took an  
25 oath here. And I take that really, really

1 seriously. And that oath applies to my charge and  
2 to what I've come here to opine about today.

3 I don't think it's responsible -- because  
4 this is a formal setting. This isn't just you and  
5 I at lunch talking about our opinions. This is a  
6 formal setting where I've taken an oath, so it  
7 would not be responsible for me to be opining  
8 about topics that are not in here.

9 I haven't done this rigorous analysis of  
10 those prenatal exposures. Maybe I'll be asked to  
11 in the future, in which case, you know, then I  
12 would need to form those opinions and really do  
13 that level of research.

14 But I take this really seriously, so I  
15 don't feel comfortable just sort of, you know,  
16 telling you my opinions about things, even those  
17 that I have expertise on.

18 Q. Do you think it's important in formulating  
19 your opinions in the case to determine whether  
20 with respect to autism and ADHD the die is already  
21 cast in utero before a child is ever born due to  
22 exposure to lead or arsenic?

23 A. Can you -- I'm not exactly -- the question  
24 was sort of -- it took a turn.

25 Q. Okay. I'm talking about the prenatal



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1 period. I'm talking about when babies are in the  
 2 womb. Do you understand that?  
 3 A. Yes.  
 4 Q. Okay. I'm talking about the fact we've  
 5 already established that mothers can release heavy  
 6 metals from their bone and from their bloodstream  
 7 in -- crosses the placenta and gets to the baby.  
 8 Correct?  
 9 A. Correct.  
 10 Q. And this is a time of critical  
 11 neurodevelopment in the womb. Correct?  
 12 A. Yes. I do believe that there's a lot of  
 13 neurodevelopment that occurs prenatally.  
 14 Q. So it would be important in expressing  
 15 your opinions in this case to be able to rule out  
 16 the fact that prenatal exposure to heavy metals in  
 17 the womb causes ASD or ADHD in children. Correct?  
 18 A. No.  
 19 Q. It's not important?  
 20 A. No.  
 21 Q. Do you understand there's going to be a  
 22 general causation hearing in this case in  
 23 December, December 2025, in federal court in  
 24 San Francisco?  
 25 A. I don't know about the date. No.

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1 are attorneys?  
 2 A. They're all. They're all attorneys.  
 3 Q. Siblings?  
 4 A. Yes.  
 5 Q. How many?  
 6 A. My brother is an attorney, my  
 7 sister-in-law is an attorney, my mother -- she's  
 8 retired. Actually, she's still an attorney.  
 9 MR. ESFANDIARY: Mike, I could use a  
 10 bathroom break. We've been going for over an  
 11 hour.  
 12 MR. KLATT: Let me ask just one or two  
 13 more questions and then we'll break.  
 14 Q. If you testify in December at the  
 15 causation hearing and Judge Corley asks you,  
 16 Dr. Gardener, as someone whose work has centered  
 17 around diet and other environmental causes for  
 18 neurologic illnesses, what is your opinion whether  
 19 prenatal exposure to babies in their mother's  
 20 wombs to lead and arsenic can cause autism at that  
 21 point in time, how are you going to answer her?  
 22 MR. ESFANDIARY: Objection, calls for  
 23 speculation.  
 24 A. I mean, I guess I would want to sort of  
 25 learn from the lawyers in this case and any other

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1 Q. Do you understand that the judge in that  
 2 case is Judge Corley?  
 3 A. No.  
 4 Q. Do you understand that Judge Corley may be  
 5 entitled to ask you questions at that hearing if  
 6 you appear and testify?  
 7 A. I've never testified. I would say that  
 8 I'm fairly unfamiliar with how that all plays out,  
 9 who asks questions when.  
 10 Every one of my family is a lawyer. I've  
 11 seen plenty of real-life cases. I've watched my  
 12 father. But I haven't paid attention to it. I  
 13 don't know all the rules. I can say I will follow  
 14 all of them.  
 15 Q. I would hope so.  
 16 A. Whatever the judge is allowed to ask me  
 17 and I am expected to answer, I will answer to the  
 18 best of my abilities.  
 19 But if you're asking what I'm familiar  
 20 with in terms of what the judge may or may not ask  
 21 about, I'm not fully versed on that. I haven't  
 22 been through it yet.  
 23 Q. Is your father a lawyer?  
 24 A. He is.  
 25 Q. And do you have other close relatives who

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1 lawyers in my life about, like, you know, what am  
 2 I supposed to say to a judge when they ask me  
 3 about something that's touched upon in my report  
 4 but isn't, like, the central focus, is not part of  
 5 my charge, what am I supposed to do?  
 6 And I will do whatever I'm supposed to do  
 7 professionally in that setting.  
 8 Q. As a scientist, is it important to you to  
 9 rule out other possible alternative causes of  
 10 autism and ADHD in children other than baby food?  
 11 A. To rule them out? Like, is it -- like, do  
 12 I need to say mothers who jump rope during  
 13 pregnancy -- in order to say if lead and arsenic  
 14 cause autism, do I need to know whether mothers  
 15 who jump rope during their pregnancy, does that  
 16 cause autism? No. That's not important.  
 17 What I would need to rule out is the  
 18 possibility that lead and arsenic could -- like,  
 19 as an epidemiologist, I understand that autism,  
 20 ADHD, and virtually all chronic conditions are  
 21 multifactorial.  
 22 If we were talking about a condition that  
 23 was really entirely genetic, like having high  
 24 lipoprotein (a), even high lipoprotein (a) isn't  
 25 100 percent genetic, but it's very, very, very,

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1 very genetic.  
 2 I guess I would need to -- in order to  
 3 form opinions about other factors, I would need to  
 4 know if those factors were even, like, possible.  
 5 Like, that is the crux here. I talked  
 6 about that in my report. But that doesn't mean  
 7 having to rule out everything else.  
 8 MR. KLATT: We can take break.  
 9 MR. ESFANDIARY: Perfect. Thank you.  
 10 THE VIDEOGRAPHER: This concludes Media  
 11 Number 2. Going off the record at 11:27 a.m.  
 12 (Recess, 11:27 a.m. to 11:37 a.m.)  
 13 THE VIDEOGRAPHER: This begins Media  
 14 Number 3. Going back on the record, 11:37 a.m.  
 15 BY MR. KLATT:  
 16 Q. You said earlier, Dr. Gardener, that you  
 17 worked with people at the HHG, the Hussman  
 18 Institute for Human Genomics at the University of  
 19 Miami Miller School of Medicine?  
 20 A. Yes, I did.  
 21 Q. Who do you work with there?  
 22 A. I have worked with Susan Blanton.  
 23 Q. Who else?  
 24 A. Liyong Wang.  
 25 Q. Anyone else?

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1 Human Genomics at the University of Miami has ever  
 2 told you they think baby food is causing autism or  
 3 ADHD. Correct?  
 4 A. I have never had a conversation with  
 5 anyone at the Hussman Institute for Human Genomics  
 6 about autism, that I recall, or ADHD.  
 7 Q. So no one there has told you they think  
 8 that baby food causes or plays a role in autism,  
 9 ASD, or ADHD. Correct?  
 10 A. I've never had any conversations with  
 11 anyone at the HHG about baby food or about autism  
 12 or about ADHD.  
 13 Q. But autism is a major area of their  
 14 research. Correct?  
 15 A. I don't know what percentage of their  
 16 research . . .  
 17 Q. Do you know they're conducting ongoing  
 18 studies of families whose children have autism and  
 19 siblings of children who have autism to determine  
 20 the genetic basis for autism? Are you aware of  
 21 that?  
 22 A. I am not aware of any of their work  
 23 outside of sort of what I have collaborated on.  
 24 Q. So they haven't asked you to have any  
 25 input on their studies of autism. Correct?

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1 A. What's his name? I'm blanking on the  
 2 guy's name. I've worked in the past with Susan  
 3 Slifer.  
 4 Q. How do you spell her name?  
 5 A. S-L-I-F-E-R.  
 6 I don't remember the guy's name who I just  
 7 wrote a . . .  
 8 Q. Have you ever told any of the people  
 9 you've worked with at the HHG, Hussman Institute  
 10 for Human Genomics at the University of Miami,  
 11 your opinion that trace heavy metals in baby food  
 12 causes autism?  
 13 A. I don't think so. I've never had an  
 14 occasion to -- I've never talked with them about  
 15 autism.  
 16 Q. So you haven't proposed that you  
 17 collaborate with them on any study about genetics  
 18 and autism and heavy metals and autism. Would  
 19 that be correct?  
 20 A. Never. No. All of my work with the HHG  
 21 people has been in relation to dementia, late-life  
 22 cognitive decline, cognitive function, cognitive  
 23 impairment, stroke, and then subclinical vascular  
 24 outcomes like carotid disease.  
 25 Q. And no one at the Hussman Institute for

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1 A. We work on issues related to dementia,  
 2 cognitive impairment, cognitive decline, stroke.  
 3 We're very busy with the topics that we have  
 4 covered. I don't have time to work with them on  
 5 autism.  
 6 Q. So my question is, no one at the Hussman  
 7 Institute for Human Genomics at the University of  
 8 Miami Miller School of Medicine has ever asked you  
 9 to collaborate with them on a study about autism.  
 10 Correct?  
 11 A. I've never had any conversations with  
 12 anyone at the HHG about autism, baby food. I  
 13 have extensive collaboration with them about  
 14 dementia, cognitive impairment, stroke, and then  
 15 subclinical vascular outcomes.  
 16 Q. Were you aware of their work on the  
 17 genetics of autism before I brought that to your  
 18 attention today?  
 19 A. I have been aware they do some autism  
 20 research. What it is, the extent, who works on  
 21 it, how much, what they have found, I'm not  
 22 familiar with.  
 23 MR. KLATT: Let's mark this.  
 24 (Exhibit 7 marked for identification)  
 25 A. Every time you do this I feel like I'm

|  |   |
|--|---|
| <p style="text-align: right;">Page 109</p> <p>1 bracing myself for some article I've coauthored.</p> <p>2 Q. You've read my mind.</p> <p>3 So what I've just handed you is Exhibit 7.</p> <p>4 And you're correct, it is an article that you</p> <p>5 appear to have coauthored with Jaclyn Bowen and</p> <p>6 Sean Callan. Correct?</p> <p>7 A. Correct.</p> <p>8 Q. And the title of the article is "Heavy</p> <p>9 metals and phthalate" --</p> <p>10 Is that the way you say that?</p> <p>11 A. That is correct.</p> <p>12 Q. "Heavy metals and phthalate contamination</p> <p>13 in prenatal vitamins and folic acid supplements."</p> <p>14 Correct?</p> <p>15 A. Correct.</p> <p>16 Q. And you say -- that was published this</p> <p>17 year?</p> <p>18 A. Yeah, I guess it was.</p> <p>19 Q. February of 2025. Correct?</p> <p>20 A. I guess so.</p> <p>21 Q. In "Environmental Research"?</p> <p>22 A. That is correct.</p> <p>23 Q. And in the abstract you say the objective,</p> <p>24 "The goal is to characterize the contamination of</p> <p>25 prenatal vitamins and folate/folic acid</p>   | <p style="text-align: right;">Page 110</p> <p>1 supplements with lead, cadmium, and phthalates."</p> <p>2 Correct?</p> <p>3 A. That is correct.</p> <p>4 Q. And so in your introduction here,</p> <p>5 Dr. Gardener, you say, "Fetal development is a</p> <p>6 vulnerable period for exposure to toxicants,</p> <p>7 including heavy metals and endocrine disrupting</p> <p>8 compounds, EDCs." Correct?</p> <p>9 A. Correct.</p> <p>10 Q. You go on to say, "Exposure to heavy</p> <p>11 metals (e.g. lead and cadmium) and EDCs (e.g.</p> <p>12 phthalates) in utero have been shown to result in</p> <p>13 pregnancy complications and impairments in</p> <p>14 neurodevelopment, cognitive and behavioral health,</p> <p>15 growth, metabolic and cardiovascular health, and</p> <p>16 reproductive health throughout childhood."</p> <p>17 Correct?</p> <p>18 A. Correct.</p> <p>19 Q. And you cite, it looks like, maybe 20</p> <p>20 papers there in support of those statements. Is</p> <p>21 that correct?</p> <p>22 A. I cited 22.</p> <p>23 Q. And those all relate to in utero effects.</p> <p>24 Correct?</p> <p>25 A. Presumably.</p>   |
| <p style="text-align: right;">Page 111</p> <p>1 Q. "In utero" means in the womb before birth.</p> <p>2 Correct?</p> <p>3 A. Correct.</p> <p>4 Q. And then you go on to say, "Phthalates</p> <p>5 represent a class of plasticizers that are</p> <p>6 frequently added to plastics, including tubing and</p> <p>7 packaging, as well as fragranced personal care and</p> <p>8 cleaning products." Correct?</p> <p>9 A. Correct.</p> <p>10 Q. And phthalates are ubiquitous in the</p> <p>11 environment, are they not?</p> <p>12 MR. ESFANDIARY: Objection, calls for</p> <p>13 opinions that are beyond the scope of</p> <p>14 Dr. Gardener's opinions in this case.</p> <p>15 A. So phthalates are found in PVC, plastic,</p> <p>16 in fragrance products, like I mentioned here in</p> <p>17 some plastics.</p> <p>18 Q. They're in a wide range of consumer</p> <p>19 products. Correct?</p> <p>20 MR. ESFANDIARY: Objection, beyond the</p> <p>21 scope of Dr. Gardener's opinions.</p> <p>22 A. It depends on how you define "wide range."</p> <p>23 I mean, it's mostly like plastics and ingredients</p> <p>24 in, like, personal care products. Like to make</p> <p>25 fragrance stick to you.</p> | <p style="text-align: right;">Page 112</p> <p>1 Q. For example, phthalates are used in vinyl</p> <p>2 flooring, in wall coverings?</p> <p>3 MR. ESFANDIARY: Objection, beyond the</p> <p>4 scope.</p> <p>5 A. Not necessarily. So you can make PVC</p> <p>6 without phthalates. Phthalates is one type of</p> <p>7 plasticizers. I would say it used to be the most</p> <p>8 common type of plasticizers, but now it's more</p> <p>9 often that it's or it's highly frequent that it's</p> <p>10 replaced with other types of plasticizers like</p> <p>11 organotins.</p> <p>12 Q. But my question is phthalates are used in</p> <p>13 vinyl floorings and wall coverings. Some, not</p> <p>14 necessarily all of them, but some. Correct?</p> <p>15 A. Phthalates are used in some flooring, some</p> <p>16 wall coverings.</p> <p>17 Q. They're used in plastic packaging.</p> <p>18 Correct?</p> <p>19 A. Phthalates can be used in some plastic</p> <p>20 packaging.</p> <p>21 Q. And phthalates can be used in shampoos,</p> <p>22 soaps, lotions, perfumes. Correct?</p> <p>23 MR. ESFANDIARY: Objection. Beyond the</p> <p>24 scope of Dr. Gardener's disclosed opinions.</p> <p>25 A. It depends on the product. Some -- I am</p> |

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1 not sort of fully versed in all the regulations  
2 about plasticizer use right now.

3 But yeah. When I think of those sort of  
4 products, phthalates is a potential exposure.

5 Q. That's what you meant when you were  
6 referring to phthalates being frequently added to  
7 fragranced personal care and cleaning products.  
8 Correct?

9 A. Right. I mean, like, phthalates, they're  
10 not on products as, like, an ingredient. You're  
11 not going to see that, that I've seen. But they  
12 can be -- what you'll often see is the term  
13 "fragrance," which is an undisclosed, ambiguous  
14 ingredient that can include phthalates.

15 Q. In products like shampoos, soaps, lotions,  
16 perfumes. Correct?

17 MR. ESFANDIARY: Objection, beyond the  
18 scope.

19 A. Phthalates can be in perfumes, lotions,  
20 shampoos, personal care products.

21 Q. They can be in detergents and household  
22 cleaners too. Right?

23 MR. ESFANDIARY: Same objection.

24 A. They can -- I think about it more in,  
25 like -- like dryer sheets and things like that.

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1 But they can be in cleaning products and  
2 fragranced items to make fragrance stick.

3 Q. Phthalates can be plasticizers in  
4 children's toys. Correct?

5 MR. ESFANDIARY: Objection, beyond the  
6 scope of Dr. Gardener's opinions.

7 A. Now they're highly regulated in children's  
8 toys.

9 Q. But they have been historically in  
10 children's toys. Correct?

11 A. Historically phthalates have been in some  
12 children's toys. Yes. In PVC toys.

13 Q. Going on -- well, let me ask you this: Do  
14 you think phthalates in and of themselves are  
15 capable of causing autism, autism spectrum  
16 disorder, or ADHD in children via either in utero  
17 exposure or postbirth exposure?

18 MR. ESFANDIARY: Objection, calls for  
19 undisclosed opinion, beyond the scope of  
20 Dr. Gardener's opinions in this case.

21 Q. You can answer.

22 A. So in this situation, you said autism or  
23 autism spectrum disorder, which is different than  
24 how you've worded things in the past.

25 Was there an importance for that

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1 distinction?

2 Q. Not important at all. I'll rephrase it.

3 Is it your opinion that phthalates are  
4 capable of causing ASD or ADHD or both in children  
5 due to either their exposure in utero before birth  
6 or after birth postnatally in infancy and early  
7 childhood?

8 MR. ESFANDIARY: Objection, calls for  
9 opinions, beyond the scope of Dr. Gardener's  
10 disclosed opinions in this case.

11 If you have an opinion, you can offer it.

12 A. I haven't researched that at all. I  
13 actually can't recall any papers that I have read  
14 on phthalates and autism, again, at all recently.  
15 So I'm not able to provide an opinion on that.

16 Q. Well, let's go back up to the first two  
17 sentences in your article. You say, "Fetal  
18 development is a vulnerable period for exposures  
19 to toxicants, including heavy metals and endocrine  
20 disrupting compound (EDCs)."

21 And then in very next sentence you say,  
22 "Exposure to heavy metals (e.g. lead and cadmium)  
23 and EDCs (e.g. phthalates) in utero have been  
24 shown to result in pregnancy complications and  
25 impairments in neurodevelopment, cognitive and

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1 behavioral health, growth, metabolic and  
2 cardiovascular health, and reproductive health  
3 throughout childhood." Correct?

4 A. Uh-hmm. Yes.

5 Q. So you believe phthalates are capable of  
6 causing impairments in neurodevelopment, cognitive  
7 and behavioral health, either due to a child's  
8 exposure in utero or after birth. Correct?

9 MR. ESFANDIARY: Objection, calls for  
10 undisclosed opinions in this case. Beyond the  
11 scope.

12 Doctor, if you have an opinion, you can  
13 offer it.

14 A. So no. The way that this sentence is  
15 written with all these -- with all of these  
16 references does not imply that phthalates have  
17 been shown to result in all of those things.

18 This is more general about, you know, I  
19 mentioned phthalates falls under this EDC umbrella  
20 and metals and EDCs in general have been  
21 associated with all these different outcomes.

22 That does not imply that each one of these  
23 compounds have been -- that I've included  
24 references for each one of these compounds in all  
25 of those outcomes.

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1 Q. Phthalates is the one example of an  
2 endocrine disrupting compound that you pointed out  
3 in this article. Correct?

4 A. This is correct.

5 Q. Do you believe phthalates in utero can  
6 result in impairments in neurodevelopment,  
7 cognitive and behavioral health?

8 MR. ESFANDIARY: Objection, calls for  
9 undisclosed opinions, beyond the scope of  
10 Dr. Gardener's disclosed opinions in this case.

11 A. I am not prepared to opine on that. Like,  
12 I have not done any systematic review of that  
13 data.

14 Q. But that's what you told the world in  
15 publishing this article, that you believed that  
16 endocrine disrupting compounds, in particular  
17 phthalates, in utero have been shown to result in  
18 pregnancy complications and impairments in  
19 neurodevelopment, cognitive and behavioral health.  
20 Correct?

21 A. Where do you see that? In particular  
22 phthalates have been --

23 Q. I read the second sentence in your  
24 article, your 2025 article.

25 A. Yeah. No. What I am saying is that heavy

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1 metals and EDCs have been shown to result in all  
2 of these different outcomes.

3 I gave phthalates as an example, but it's  
4 not like -- it's not like this list of references  
5 includes a reference for phthalates in relation to  
6 all those.

7 That might exist. I don't know. The  
8 reviewers would not have read it that way. My  
9 colleagues would not have interpreted it that way.  
10 It's not like -- I think what you're interpreting  
11 this sentence to mean, that I could sit here and  
12 say based on this sentence I have done a  
13 literature review to say that phthalates -- in  
14 this whole sentence, phthalates cause all of these  
15 different outcomes.

16 That's not what this sentence implies.  
17 Scientists would not read it that way. And if it  
18 exists, it might, it might not. I am not here to  
19 prepare to opine on phthalates in relation to all  
20 of these things today.

21 Q. Why did you say phthalates, as an example,  
22 in utero have been shown to result in pregnancy  
23 complications and impairments in neurodevelopment,  
24 cognitive and behavioral health?

25 Why did you put that in this article? It

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1 could be read by any scientist or doctor out  
2 there.

3 MR. ESFANDIARY: So hang on. There was  
4 two questions there. It's compound.

5 Which one are you asking her?

6 Q. When you put this sentence in the article  
7 to be read by scientists, laypeople, physicians  
8 out there in the world and you used phthalates as  
9 an example, why did you include phthalates as  
10 something in utero that has been shown to result  
11 in pregnancy complications, impairments in  
12 neurodevelopment, cognitive and behavioral health?

13 A. Because this study was about -- the EDCs  
14 that were the focus of this study were phthalates.

15 So it could -- people might be reading  
16 this study and be like, all right, endocrine  
17 disrupting chemical, how does this relate here? I  
18 wanted to make it clear that phthalates were a  
19 type of endocrine disrupting chemical.

20 Q. Well, let me just ask you, apart from what  
21 you said in the article, is it your opinion that  
22 endocrine disrupting compounds, including  
23 phthalates, in utero can cause impairments in  
24 neurodevelopment, cognitive and behavioral health?  
25 Is that your opinion?

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1 MR. ESFANDIARY: Objection, calls for an  
2 undisclosed opinion, beyond the scope of  
3 Dr. Gardener's testimony in this case.

4 A. Yes, I am going to repeat it again. I'm  
5 here under oath. I'm here. My words matter. And  
6 my words are, you know, trusted. I want to be  
7 really careful to only talk about topics that I'm  
8 prepared to talk about under oath. I take that  
9 really, really carefully.

10 I am not prepared to talk under oath about  
11 the impact of in utero exposure to phthalates with  
12 all of these outcomes today.

13 Q. Aren't you careful when you write a  
14 journal article that's published in a  
15 peer-reviewed journal to be careful about your use  
16 of words?

17 A. Absolutely. And I would love for all of  
18 those scientists to read it. I am extremely  
19 careful. My colleagues, we all review these  
20 papers. It's peer-reviewed.

21 This was peer-reviewed and published by  
22 one of the most respected journals out there,  
23 "Environmental Research." So it's extremely  
24 important for me to pass and excel in that very  
25 rigorous review process and to make sure that it



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| <p style="text-align: right;">Page 121</p> <p>1 is well understood by the scientific community.</p> <p>2 It's also very understood that people who</p> <p>3 don't have this training, lawyers, would not</p> <p>4 understand accurately every sentence I've read.</p> <p>5 My parents are both extremely smart.</p> <p>6 They're both lawyers. There's a lot of sentences</p> <p>7 in here that they would not understand correctly.</p> <p>8 It's not surprising that this sentence,</p> <p>9 that we might not totally be on the same page</p> <p>10 about this sentence.</p> <p>11 I wrote this for a scientific, for a</p> <p>12 medically trained audience.</p> <p>13 Q. Exactly. And did any peer reviewer of</p> <p>14 this article say, Dr. Gardener, don't suggest in</p> <p>15 here that EDCs, for example, phthalates, in utero</p> <p>16 have been shown to result in impairments in</p> <p>17 neurodevelopment, cognitive and behavioral health?</p> <p>18 A. No, they did not.</p> <p>19 Q. Okay.</p> <p>20 A. If they had, something like that, I would</p> <p>21 absolutely change the sentence.</p> <p>22 The peer reviewers for "Environmental</p> <p>23 Research" are top of the line. This is a really</p> <p>24 esteemed journal. If you get asked to review for</p> <p>25 this journal, you are far more likely to say yes</p>                                       | <p style="text-align: right;">Page 122</p> <p>1 than many other journals.</p> <p>2 And if a reviewer, a trusted reviewer, had</p> <p>3 said, "This sentence, I think you're really</p> <p>4 stretching here, that doesn't sound right, it's</p> <p>5 going to be misinterpreted for this audience," I</p> <p>6 would have absolutely taken that into</p> <p>7 consideration.</p> <p>8 Q. And so you were perfectly willing to</p> <p>9 represent in this article, as approved by peer</p> <p>10 reviewers, that endocrine disrupting compounds,</p> <p>11 including phthalates, in utero have been shown to</p> <p>12 result in impairments in neurodevelopment,</p> <p>13 cognitive and behavioral health. Correct?</p> <p>14 A. So in terms of this sentence, what we said</p> <p>15 is that exposure to heavy metals and EDCs have</p> <p>16 been shown to result in all of those.</p> <p>17 That does not mean that EDCs -- that every</p> <p>18 single metal and every single EDC have been shown</p> <p>19 for all of those different outcomes.</p> <p>20 It's well understood in the medical field</p> <p>21 what we're saying, that heavy metals -- the point</p> <p>22 is that heavy metals and endocrine disrupting</p> <p>23 compounds have been shown -- and specifically in</p> <p>24 utero exposure have been shown to have very</p> <p>25 wide-ranging health effects, in the literature.</p> |
| <p style="text-align: right;">Page 123</p> <p>1 And that was the point of this sentence.</p> <p>2 Q. So let me ask you as an expert in diet and</p> <p>3 other environmental causes for neurologic</p> <p>4 diseases, is it your opinion that endocrine</p> <p>5 disrupting compounds, including phthalates, in</p> <p>6 utero can cause impairments in neurodevelopment,</p> <p>7 cognitive and behavioral health, like you stated</p> <p>8 in the article? Is that your opinion or not?</p> <p>9 MR. ESFANDIARY: So I think this has been</p> <p>10 asked and answered multiple times. I will object</p> <p>11 again to beyond the scope of Dr. Gardener's</p> <p>12 proffered expert opinion in this case.</p> <p>13 Q. Is it your opinion that phthalates and</p> <p>14 other endocrine disrupting compounds in utero can</p> <p>15 cause impairments in neurodevelopment, cognitive</p> <p>16 and behavioral health, or not?</p> <p>17 MR. ESFANDIARY: Same objections, beyond</p> <p>18 the scope.</p> <p>19 A. I take this oath really seriously. You</p> <p>20 know, my opinions when I'm talking about them here</p> <p>21 are opinions that have been really, really</p> <p>22 scrutinized. Not just opinions that I would have,</p> <p>23 you and me, at lunch.</p> <p>24 That was not part of my charge. I did not</p> <p>25 come here today prepared to provide an expert</p> | <p style="text-align: right;">Page 124</p> <p>1 witness level opinion on EDCs, including</p> <p>2 phthalates as well as other EDCs, in relation to</p> <p>3 all of these outcomes.</p> <p>4 Q. But you're willing to represent that in</p> <p>5 the peer-reviewed medical literature. Correct?</p> <p>6 A. I was absolutely comfortable writing this</p> <p>7 sentence. All of my colleagues were comfortable</p> <p>8 writing this sentence. The reviewers were</p> <p>9 comfortable with me publishing this sentence. The</p> <p>10 esteemed editors of this esteemed journal were</p> <p>11 comfortable with me writing that sentence.</p> <p>12 That is very different than me providing</p> <p>13 you with my opinions under oath in this</p> <p>14 circumstance. It's different because the</p> <p>15 implications of the sentence and the situation</p> <p>16 that we're in right now are very different.</p> <p>17 Q. You're saying you use more rigor in</p> <p>18 forming legal opinions than you do scientific</p> <p>19 opinions in the published literature? Is that</p> <p>20 what you're saying?</p> <p>21 MR. ESFANDIARY: No. You're misstating</p> <p>22 the testimony.</p> <p>23 Go ahead.</p> <p>24 A. They're just totally different.</p> <p>25 First of all, you are misunderstanding the</p>   |



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1 sentence. So that's just the first step.  
 2 But if you were not misunderstanding the  
 3 sentence, there is a very different -- there's a  
 4 big difference between writing these sentences  
 5 where it's understood, where I'm part of a  
 6 scientific community and trusted how scientists  
 7 who are the target audience for this will read  
 8 this sentence, and this setting where I'm actually  
 9 talking about things under oath in a -- in a  
 10 situation that carries a huge weight for a lot of  
 11 people, including you.  
 12 I mean, it's out of respect for everyone  
 13 in this situation that my responsibility here is  
 14 much greater than a sentence written in an article  
 15 that a lay audience person might not interpret  
 16 totally correctly.  
 17 Q. This isn't just any article, is it,  
 18 Dr. Gardener? This is an article published, as  
 19 you've just said, in a reputable peer-reviewed  
 20 medical or scientific journal. Correct?  
 21 A. That is correct.  
 22 Q. Do you apply a different standard for  
 23 opinions you express in peer-reviewed medical  
 24 journal articles in highly respected journals than  
 25 you do in giving opinions in the courtroom?

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1 Q. What did I --  
 2 MR. ESFANDIARY: Don't interrupt her.  
 3 Please finish your answer.  
 4 A. I understand you are a lawyer. You're  
 5 going to read this sentence differently than a  
 6 scientist would.  
 7 The scientists who coauthored this with  
 8 me, who reviewed it, who edited the paper, I  
 9 assume read it the way that it was intended,  
 10 saying that heavy metals in general and EDCs have  
 11 caused a wide range of health outcomes.  
 12 That doesn't . . .  
 13 I can tell you're about to interrupt me so  
 14 I stopped.  
 15 Q. Are you saying that I read your words into  
 16 the record inaccurately?  
 17 A. You read the actual -- I actually can't  
 18 remember if you read the actual -- you did say "in  
 19 particular phthalates" and it said "e.g.," which  
 20 is "for example phthalates."  
 21 So this does not -- in the scientific  
 22 world, this does not mean that phthalates have  
 23 been proven to cause all of these different  
 24 outcomes. It's just -- it was a general sentence  
 25 saying that heavy metals and endocrine disrupting

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1 A. It's very, very different. It's a very,  
 2 very different process.  
 3 Q. And you use a different methodology?  
 4 A. No. I use a similar methodology.  
 5 But you are reading this sentence --  
 6 you're reading this sentence with -- differently  
 7 than scientists would read it, which is -- you're  
 8 a lawyer. That's okay. I don't want to be  
 9 offensive to you in how you're reading this  
 10 sentence.  
 11 But it's really different than sitting  
 12 here under oath in a very, very high-stakes  
 13 situation than wondering how a lawyer might  
 14 misread a sentence in an introduction to a very,  
 15 very important piece of science.  
 16 Q. Exhibit 7, this article we've been talking  
 17 about for the last 15 minutes or so, are your  
 18 words. Correct?  
 19 A. They are. Yes.  
 20 Q. I have not misread them at all. Correct?  
 21 I have read them exactly like you wrote them in  
 22 the article. Correct?  
 23 A. No. What I keep saying is I think you are  
 24 misreading them. I don't mean to be offensive. I  
 25 am a scientist --

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1 chemicals have been shown in the literature. I  
 2 didn't write "in the literature." To result in  
 3 all of these -- in this broad range of outcomes.  
 4 Q. The reason that I said "in particular  
 5 phthalates" is that's the one example of an  
 6 endocrine disrupting compound you chose to  
 7 illustrate in this article. Correct?  
 8 A. Yes. And I did that because that is the  
 9 one endocrine -- the one type of endocrine  
 10 disrupting chemical that we were measuring in this  
 11 article. Because there are plenty of people who  
 12 would read this study who might not know what  
 13 phthalates are. Might be like, oh, endocrine  
 14 disrupting chemicals. I know what that is.  
 15 Phthalates fall under that category.  
 16 Q. I'm going to read the sentence again, and  
 17 I just want you to tell on the record whether I  
 18 read the sentence, the words you wrote, without  
 19 adding anything.  
 20 A. Sure.  
 21 Q. I'm referring to Exhibit 7 in the  
 22 introduction, the second sentence -- let's start  
 23 with the first sentence.  
 24 "Fetal development is a vulnerable period  
 25 for exposure to toxicants, including heavy metals

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| <p style="text-align: right;">Page 129</p> <p>1 and endocrine disrupting compounds (EDCs)."</p> <p>2 Did I read that correctly?</p> <p>3 A. You read that correctly.</p> <p>4 Q. The next sentence, "Exposure to heavy</p> <p>5 metals (e.g." --</p> <p>6 Which means "for example." Correct?</p> <p>7 A. Correct.</p> <p>8 Q. -- "lead and cadmium) and EDCs (e.g.</p> <p>9 phthalates)" --</p> <p>10 Meaning "for example phthalates."</p> <p>11 Correct?</p> <p>12 A. Correct.</p> <p>13 Q. -- "in utero have been shown to result in</p> <p>14 pregnancy complications and impairments in</p> <p>15 neurodevelopment, cognitive and behavioral health,</p> <p>16 growth, metabolic and cardiovascular health, and</p> <p>17 reproductive health throughout childhood."</p> <p>18 That's your words and I read them</p> <p>19 accurately. Correct?</p> <p>20 A. Yes, you did.</p> <p>21 Q. Let's continue on. The bottom of that</p> <p>22 paragraph you say, "Lead" --</p> <p>23 And I'm going to read your words. Tell me</p> <p>24 if I get any of them wrong.</p> <p>25 "Lead, cadmium, and phthalates are</p>  | <p style="text-align: right;">Page 130</p> <p>1 clinically relevant and ubiquitous environmental</p> <p>2 toxicants to which pregnant people are frequently</p> <p>3 exposed in the United States and globally."</p> <p>4 Did I read that correctly?</p> <p>5 A. You did.</p> <p>6 Q. And then you have several citations to</p> <p>7 support that. Correct?</p> <p>8 A. Correct.</p> <p>9 Q. What did you mean by your use of the word</p> <p>10 "ubiquitous" here?</p> <p>11 MR. ESFANDIARY: One second. Insofar as</p> <p>12 you're asking about phthalates, I'm going to lodge</p> <p>13 an objection to beyond the scope of Dr. Gardener's</p> <p>14 testimony and opinions in this case. To the</p> <p>15 extent you're talking about lead and was cadmium,</p> <p>16 that's acceptable.</p> <p>17 MR. KLATT: No.</p> <p>18 MR. ESFANDIARY: Yes.</p> <p>19 MR. KLATT: No, there's no such objection.</p> <p>20 That's completely out of line.</p> <p>21 Your objections have been speaking</p> <p>22 objections. They go beyond what Judge Corley</p> <p>23 permits. She allows "objection" and you can state</p> <p>24 a one- or two-word grounds. It doesn't need any</p> <p>25 explanation.</p>  |
| <p style="text-align: right;">Page 131</p> <p>1 What you just did right then, Pedram, was</p> <p>2 totally inappropriate. And I guarantee you I can</p> <p>3 show you Judge Corley's opinions or we can go to</p> <p>4 her where she has sanctioned people for going</p> <p>5 beyond those types of objections.</p> <p>6 MR. ESFANDIARY: Okay. So I disagree with</p> <p>7 all of that. I was just reiterating my objection</p> <p>8 that to the extent you're asking about compounds</p> <p>9 and chemicals that are not the subject of this</p> <p>10 litigation, that are not being pursued in this</p> <p>11 litigation, that there are no claims regarding in</p> <p>12 this litigation, I'm going to continue to object</p> <p>13 as beyond the scope in the same manner that you</p> <p>14 guys have objected when we deposed your experts</p> <p>15 about compounds and chemicals and matters that are</p> <p>16 not within the 10-yard lines of their opinions in</p> <p>17 this case.</p> <p>18 Please let me finish before you interrupt.</p> <p>19 So I'm going to continue lodging the same</p> <p>20 objection to the extent you're asking about</p> <p>21 phthalates.</p> <p>22 To the extent you want to ask about heavy</p> <p>23 metals, that's fair game and you're welcome to do</p> <p>24 so.</p> <p>25 MR. KLATT: You know there's no limitation</p> | <p style="text-align: right;">Page 132</p> <p>1 under the rules to ask an expert witness their</p> <p>2 opinion about scientific matters that they claim</p> <p>3 to be an expert on.</p> <p>4 MR. ESFANDIARY: You are asking her about</p> <p>5 that. I'm just objecting.</p> <p>6 MR. KLATT: That's not a valid objection.</p> <p>7 You can make the objection. You can say</p> <p>8 "objection, I believe it's irrelevant, move on" or</p> <p>9 whatever. But you don't need to give a speech</p> <p>10 about what you think is within the scope or</p> <p>11 without the scope. That's not an appropriate</p> <p>12 objection.</p> <p>13 MR. ESFANDIARY: Well, you're asking me,</p> <p>14 you're challenging me on the basis of my</p> <p>15 objection. So I'm just explaining to you what</p> <p>16 they are.</p> <p>17 Please, Counsel, continue asking questions</p> <p>18 of Dr. Gardener.</p> <p>19 MR. KLATT: Could you read the last</p> <p>20 question before we had the little exchange.</p> <p>21 (Pending question read)</p> <p>22 A. I just want to explain, I'm not prepared</p> <p>23 to provide expert opinions about phthalates today.</p> <p>24 That wasn't part of my charge or what I, you know,</p> <p>25 prepared for this.</p> |

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1 And, like, under oath, I just didn't -- I  
2 didn't prepare for, you know, to provide that kind  
3 of expert testimony like I did about the heavy  
4 metals.

5 MR. SACHSE: Move to strike as  
6 unresponsive.

7 Q. Dr. Gardener, you wrote an article on  
8 prenatal exposure to heavy metals and phthalates  
9 in February 2025. Correct?

10 A. That is correct.

11 Q. And as an expert who purports to be having  
12 much of their work relating to diet and other  
13 environmental exposures causing neurologic  
14 diseases, I'm entitled to ask you about your  
15 opinions as a scientist, not just things the  
16 lawyers have told you to restrict your opinions to  
17 in this case. Do you understand that?

18 MR. ESFANDIARY: Hang on. Whoa, whoa,  
19 whoa. That was very compound.

20 I object to the colloquy and I continue to  
21 object as beyond the scope. Questions related to  
22 phthalates are not the subject of this  
23 examination.

24 Doctor, if you have an opinion, you can  
25 offer it.

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1 A. I just want to say I am not a lawyer, so I  
2 don't actually know your rules in your profession  
3 about what you're allowed to ask about or not.

4 So it sounded like you were asking me if  
5 I'm aware of what you, as a lawyer, are entitled  
6 to do in this situation. And that's not -- I am  
7 not aware. I am not at all trained, not one bit,  
8 in the scope of what you're allowed to do here or  
9 not.

10 That's why Pedram is here. And you guys  
11 can discuss this. But I don't want you -- I don't  
12 want to purport to be aware of what you are or are  
13 not allowed to do.

14 Q. Do you hold yourself out as a scientific  
15 expert on diet and other environmental causes for  
16 neurologic diseases?

17 A. Yes, I do. My understanding is that the  
18 definition of being an expert is knowing a lot  
19 more, significantly more than the general public  
20 on a topic. That's what I've been told is the  
21 definition. And I absolutely do.

22 Q. Did you write a peer-reviewed journal  
23 article in what you described is an eminently  
24 respected medical journal in February 2025 about  
25 phthalate and heavy metal contamination in utero?

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1 A. I did. I want --

2 MR. ESFANDIARY: Don't interrupt her.

3 MR. KLATT: Wait. That's the response.  
4 She doesn't need to respond beyond that.

5 MR. ESFANDIARY: You don't need to tell  
6 her what she needs to respond. She needs to be  
7 able to finish answering the question, so stop  
8 interrupting her. You need to stop it.

9 MR. KLATT: You know what? We're just  
10 wasting a lot of time. We're going to come back.

11 MR. SACHSE: Let's go off the record.

12 MR. ESFANDIARY: No, I'm not willing to go  
13 off the record. Please finish. Continue.

14 MR. KLATT: We're going to call the judge,  
15 Pedram. This is totally inappropriate.

16 MR. ESFANDIARY: Answer the question,  
17 Doctor.

18 A. So when you write a peer-reviewed study --

19 MR. KLATT: This is totally nonresponsive.

20 MR. ESFANDIARY: Don't interrupt her.  
21 Please finish answering the question.

22 MR. KLATT: We're just burning time.  
23 We'll be back here.

24 MR. ESFANDIARY: You can answer the  
25 question, Doctor.

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1 A. When you write a peer-reviewed study,  
2 you -- every sentence in the introduction, in the  
3 discussion, you are not purporting to, you know,  
4 provide an expert opinion on. The introduction  
5 and the discussion is to set up the scientific  
6 question and the importance.

7 So, you know, I want to make that very  
8 clear.

9 You're not -- just because you wrote a  
10 sentence in the introduction or the discussion  
11 does not mean that based on that sentence you are  
12 prepared for an eight-hour deposition or an expert  
13 report on that. There's a really big difference.

14 If this was a review article about  
15 phthalates and reproductive health, that would be  
16 very different than having those -- that be part  
17 of a sentence in the introduction on something  
18 else.

19 This paper is not about the associations  
20 between lead and cadmium and phthalates in all of  
21 these outcomes.

22 Earlier you asked me have I ever written  
23 about lead and cadmium in neurodevelopment, and I  
24 said no. And I think what you're trying to get at  
25 is, oh, now I have, now I've actually published on

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| <p style="text-align: right;">Page 137</p> <p>1 this.</p> <p>2 And so I think I have actually</p> <p>3 misunderstood. Earlier you said have you</p> <p>4 published on this? And I said no. And now you're</p> <p>5 sort of implying gotcha, you actually have</p> <p>6 published on this.</p> <p>7 That's really different than having a</p> <p>8 sentence in an introduction.</p> <p>9 MR. KLATT: Objection to the long</p> <p>10 narrative answer beyond everything after "I did."</p> <p>11 MR. SACHSE: Move to strike.</p> <p>12 MR. KLATT: Move to strike.</p> <p>13 BY MR. KLATT:</p> <p>14 Q. So let's go back to the article. You,</p> <p>15 Dr. Hannah Gardener, wrote in February 2025 in a</p> <p>16 peer-reviewed journal, "Lead, cadmium and</p> <p>17 phthalates are clinically relevant and ubiquitous</p> <p>18 environmental toxicants to which pregnant people</p> <p>19 are frequently exposed in the United States and</p> <p>20 globally."</p> <p>21 I read those words correctly. Correct?</p> <p>22 A. You did.</p> <p>23 Q. What is the word you chose to use here,</p> <p>24 "ubiquitous," what is the meaning of that in this</p> <p>25 sentence?</p>  | <p style="text-align: right;">Page 138</p> <p>1 A. They're frequent exposures from different</p> <p>2 sources.</p> <p>3 Q. In the environment?</p> <p>4 A. As opposed to what?</p> <p>5 Q. Is that what you're referring to?</p> <p>6 A. I guess I don't know what would be the --</p> <p>7 when you said "in the environment," I guess I</p> <p>8 don't understand.</p> <p>9 Q. All right. So --</p> <p>10 A. Where else would they be than in the</p> <p>11 environment?</p> <p>12 Q. You would agree they're frequent exposures</p> <p>13 in the environment in the United States. Correct?</p> <p>14 A. Yes.</p> <p>15 Q. In pregnant --</p> <p>16 A. I would say, like, the point of this</p> <p>17 sentence is that these are common environmental</p> <p>18 exposures. They're not -- this isn't like --</p> <p>19 these aren't toxics that 1 percent of the</p> <p>20 population is exposed to. These are exposures</p> <p>21 that --</p> <p>22 Q. Are ubiquitous? They're everywhere.</p> <p>23 Right?</p> <p>24 A. No, they're not everywhere. Ubiquitous</p> <p>25 doesn't -- I mean, you know, words matter here in</p>  |
| <p style="text-align: right;">Page 139</p> <p>1 this legal setting.</p> <p>2 Q. Yeah. I agree.</p> <p>3 A. In a general, you know -- if you and I</p> <p>4 were at lunch, I might say they're everywhere.</p> <p>5 But here, Hannah Gardener has said</p> <p>6 these -- they're everywhere. They're in this</p> <p>7 coffee cup. I'm not saying they're necessarily in</p> <p>8 this coffee cup, but they're frequent exposures.</p> <p>9 Q. And they're frequent exposures to men,</p> <p>10 women, adults, pregnant people, to children out</p> <p>11 there in the environment. Correct?</p> <p>12 A. These are -- lead, cadmium, and phthalates</p> <p>13 are frequent exposures to men, to women, to</p> <p>14 children, to babies. Yes. I was not implying --</p> <p>15 Q. To pregnant mothers?</p> <p>16 A. Yes. In this sentence I was specifically</p> <p>17 talking about pregnant people. But they're not</p> <p>18 specific to pregnant people.</p> <p>19 Q. Let's go to the next paragraph where</p> <p>20 you're talking about prenatal vitamins. And</p> <p>21 "prenatal" means before birth. Correct?</p> <p>22 A. That is correct. Although plenty of</p> <p>23 people take prenatal vitamins prior to conception</p> <p>24 and long after pregnancy.</p> <p>25 Q. You say, "Several recent studies have</p> | <p style="text-align: right;">Page 140</p> <p>1 explored prenatal vitamins as a source of heavy</p> <p>2 metal exposure during development," with studies.</p> <p>3 Correct?</p> <p>4 A. That is correct.</p> <p>5 Q. And it continues on, "particularly because</p> <p>6 they are ingested daily for months on end by most</p> <p>7 pregnant people." Correct?</p> <p>8 A. That is correct.</p> <p>9 Q. "Indeed, several studies have found</p> <p>10 prenatal vitamins are a significant source of</p> <p>11 maternal and fetal exposure to toxic metals."</p> <p>12 Did I read that correctly?</p> <p>13 A. That is correct.</p> <p>14 Q. Why would maternal and fetal exposure be</p> <p>15 something worthy of your concern here?</p> <p>16 A. Because this study was about prenatal</p> <p>17 vitamins.</p> <p>18 Q. And the prenatal and fetal time period is</p> <p>19 a critical window for neurodevelopment. Correct?</p> <p>20 A. Where do you see that in this sentence?</p> <p>21 Q. I'm just asking you. Is the that true?</p> <p>22 A. Oh, so this has nothing to do with this?</p> <p>23 Q. I'm just asking you.</p> <p>24 A. Sorry. Can you ask that question again?</p> <p>25 I was focused on this paper.</p> |

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|--|---|
| <p style="text-align: right;">Page 141</p> <p>1 MR. KLATT: Could you read the question</p> <p>2 back, please?</p> <p>3 (Pending question read)</p> <p>4 A. Neurodevelopment occurs during the</p> <p>5 prenatal period. Yes. It also occurs --</p> <p>6 neurodevelopment of course continues on after.</p> <p>7 But yes, neurodevelopment, there's a lot of</p> <p>8 neurodevelopment during the prenatal period.</p> <p>9 Q. In fact, turn to the very last page of the</p> <p>10 article, page 5. You, Dr. Gardener, say, "Given</p> <p>11 the critical role of prenatal development on</p> <p>12 overall health, more attention needs to be paid to</p> <p>13 understanding the implications of metal exposure</p> <p>14 during this critical window." Correct?</p> <p>15 A. Sorry. Where -- I didn't see where you</p> <p>16 were.</p> <p>17 Q. The very last sentence.</p> <p>18 MR. ESFANDIARY: Right here.</p> <p>19 A. Oh, the very -- yeah.</p> <p>20 Q. Let me read it again because I want to</p> <p>21 make sure that I read it correctly.</p> <p>22 Your words are, "Given the critical role</p> <p>23 of prenatal development on overall health, more</p> <p>24 attention needs to be paid to understanding the</p> <p>25 implications of metal exposure during this</p> | <p style="text-align: right;">Page 142</p> <p>1 critical window." Correct?</p> <p>2 A. Correct.</p> <p>3 Q. The critical window being the prenatal</p> <p>4 period. Correct?</p> <p>5 A. Correct. Because a lot of people don't</p> <p>6 realize that the prenatal period affects pretty</p> <p>7 much every single part of our health.</p> <p>8 Q. Including future nerve development and</p> <p>9 cognition. Correct?</p> <p>10 A. Everything. I mean, most people -- I</p> <p>11 mean, of course exposures after -- it's not like</p> <p>12 just because the prenatal period is relevant for</p> <p>13 dementia doesn't mean that we're not all --</p> <p>14 I spent this entire week at the</p> <p>15 Alzheimer's Association meeting. We're all</p> <p>16 looking at different risk factors throughout the</p> <p>17 entire life course. That does not mean that the</p> <p>18 prenatal -- just because there's a role for</p> <p>19 prenatal development doesn't mean that there isn't</p> <p>20 also, of course, a substantial role for every, you</p> <p>21 know -- every period after that. It doesn't mean</p> <p>22 that, oh, we're not looking at what people are</p> <p>23 doing at age 60 in relation to their risk of</p> <p>24 dementia. Of course not.</p> <p>25 MR. KLATT: Object to --</p> |
| <p style="text-align: right;">Page 143</p> <p>1 A. Even though plenty of people already have</p> <p>2 dementia at that point.</p> <p>3 MR. KLATT: Object to the nonresponsive</p> <p>4 portion of the answer.</p> <p>5 Q. Go to page 4 of Exhibit 7, your article on</p> <p>6 heavy metals and phthalates. And I'm looking at</p> <p>7 the right-hand column.</p> <p>8 Are you with me on page 4?</p> <p>9 A. Yes.</p> <p>10 Q. And not the very last paragraph but the</p> <p>11 next-to-last paragraph.</p> <p>12 A. The one that starts with, "This study did</p> <p>13 not"?</p> <p>14 Q. Yes.</p> <p>15 And I wanted to read a sentence and make</p> <p>16 sure that I read your words correctly.</p> <p>17 "It is crucial to consider that people</p> <p>18 often take prenatal vitamins daily for many years</p> <p>19 during the period prior to conception through the</p> <p>20 postpartum period, including the time of pregnancy</p> <p>21 and lactation. As a result, this represents a</p> <p>22 frequent chronic long-term exposure often with the</p> <p>23 same brand and type of vitamin consumed for the</p> <p>24 entire duration among the most vulnerable segment</p> <p>25 of the population."</p>  | <p style="text-align: right;">Page 144</p> <p>1 Are those your words?</p> <p>2 A. Yes.</p> <p>3 Q. And then down at the bottom of that page</p> <p>4 you say, "Conversely, increased consumption of</p> <p>5 calcium and iron may act as antagonists for lead</p> <p>6 and cadmium."</p> <p>7 Did I read your words correctly?</p> <p>8 A. Going on to page 5?</p> <p>9 Q. Yes.</p> <p>10 A. Yup.</p> <p>11 Q. What do you mean when you say "consumption</p> <p>12 of calcium and iron may act as antagonists for</p> <p>13 lead and cadmium"? What does that mean?</p> <p>14 A. It's what I talked about in my expert</p> <p>15 report, that on a cellular basis the lead competes</p> <p>16 with calcium and iron for receptors. It's exactly</p> <p>17 what I talked about at length in my report.</p> <p>18 Q. And what does it mean for calcium and iron</p> <p>19 to be antagonists for lead and cadmium? What does</p> <p>20 it mean, "antagonist" as you use it in that</p> <p>21 sentence?</p> <p>22 A. So they're competing for receptors. Lead</p> <p>23 can mimic those receptors.</p> <p>24 Q. Do you know in the diet of a child who</p> <p>25 eats either commercial or homemade baby food, does</p>  |

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1 the amount of calcium and iron they consume far  
 2 exceed any trace heavy metals in the food they  
 3 consume?  
 4 A. In terms of the, like -- the milligrams,  
 5 for example?  
 6 Q. Exactly. Exactly.  
 7 A. Oh, my God. If it didn't, children would  
 8 have all been dead. I mean, we're talking  
 9 about -- we're talking about one of the most  
 10 potent neurotoxins here.  
 11 Q. So you're saying there's far more  
 12 consumption of calcium and iron in the diet of a  
 13 child who eats commercial or homemade baby food  
 14 than there is any trace lead or cadmium. Correct?  
 15 A. That's not what this sentence says.  
 16 Q. But do you believe that?  
 17 A. It would depend on the child.  
 18 Q. So I'm talking about in a normal child's  
 19 diet. And I think you just said that in order to  
 20 live, children have to be exposed to far more iron  
 21 and calcium than they would any trace heavy  
 22 metals. Correct?  
 23 A. What do you mean by "trace heavy metals"?  
 24 Q. Trace heavy metals, the ones we've been  
 25 talking about: lead, arsenic.

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1 Q. Did you feed your own children food that  
 2 was rich in calcium and iron?  
 3 A. I guess it depends on how you define  
 4 "rich." One of my children didn't eat a lot of --  
 5 not much dairy at all, but I made sure that my  
 6 children, to the best of my ability -- actually, I  
 7 shouldn't say I made sure. I did my best to make  
 8 sure that my kids got what was needed in terms of  
 9 calcium and iron.  
 10 Overall, my kids ate a pretty typical  
 11 diet.  
 12 Q. And why was it important for them to get  
 13 calcium and iron?  
 14 MR. ESFANDIARY: Objection. Getting kind  
 15 of beyond the scope of Dr. Gardener's testimony in  
 16 this case.  
 17 But if you have an opinion, Dr. Gardener,  
 18 go ahead.  
 19 A. Why was it important for my children?  
 20 Because calcium and iron are good for children.  
 21 They're important nutrients for children to get  
 22 for their growth and development, without getting  
 23 into any specifics about my own children.  
 24 Q. Do you know specifically why iron and  
 25 calcium are important for infants and children's

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1 A. So yeah, the lead exposure is significant.  
 2 But it is such a potent neurotoxin that if you ate  
 3 as much lead as many typical children eat of  
 4 calcium and iron, that would be catastrophic.  
 5 Q. So the typical child consumes far more  
 6 iron and calcium in their normal diet than any  
 7 trace heavy metal like lead. Correct?  
 8 MR. ESFANDIARY: Objection, overbroad.  
 9 A. I can't say for every single -- for every  
 10 single child. I mean, lead --  
 11 Q. Typically.  
 12 A. Lead is so toxic that it would not --  
 13 yeah. An understanding of this whole topic needs  
 14 to reflect the fact that lead is so toxic at such  
 15 small doses that one would never expect that you  
 16 would eat the same amount of lead that you would  
 17 eat in terms of calcium.  
 18 Q. Do you agree that calcium and iron are  
 19 regular components of a child's diet whether they  
 20 eat commercial baby food or homemade baby food?  
 21 MR. ESFANDIARY: Objection, overbroad,  
 22 calls for speculation.  
 23 A. Many children eat calcium and iron. I  
 24 don't have a stat to tell you about how the median  
 25 amount among kids in the United States --

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1 development?  
 2 A. They're important for all sorts of -- for  
 3 all sorts of different health markers. I'm not  
 4 prepared to opine on all of the ways that calcium  
 5 and iron benefit children today.  
 6 Q. But certainly in your own experience, it  
 7 was important to see that your children got enough  
 8 calcium and iron in their diet?  
 9 A. Did I think about it very much? You know,  
 10 no. I actually thought a lot more, a lot more  
 11 about limiting their exposure to lead and arsenic.  
 12 That was the bigger challenge.  
 13 Q. Did your children eat commercial baby  
 14 foods?  
 15 A. One of my children, my first child -- my  
 16 first child -- I guess both of my children have  
 17 eaten commercial baby foods. In fact, you know,  
 18 they have as older kids too. Applesauce pouches  
 19 are things that actually older children sometimes  
 20 eat too. But they both have eaten some commercial  
 21 baby food.  
 22 Q. Are they grown now?  
 23 A. They are.  
 24 Q. Are they adults?  
 25 A. No, they're not adults, but they are



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1 tweens and teens.

2 Q. And I'm sorry, did you say you had two  
3 children or three?

4 A. I have two children.

5 Q. Okay. Go back to the article. I just  
6 have one -- maybe one more question about it.  
7 Exhibit 7. And I'm going to page 5.

8 After the sentence we just read about the  
9 antagonist, it's the very next sentence. You  
10 say -- and these are your words. Make sure I read  
11 them correctly.

12 "It has been suggested that iron  
13 deficiency can cause the absorption of lead and  
14 cadmium," and you cite an article there. Correct?

15 A. Correct.

16 Q. I think we can put that aside.

17 MR. ESFANDIARY: Hey, Mike. It's 12:30.  
18 When were we thinking of doing lunch? And we've  
19 been going about an hour.

20 MR. KLATT: I'm happy to do it now if  
21 you'd like.

22 THE VIDEOGRAPHER: This concludes Media  
23 Number 3. Going off the record, 12:31 p.m.

24 (Lunch recess, 12:31 p.m. to 1:19 p.m.)  
25

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1 AFTERNOON SESSION

2 THE VIDEOGRAPHER: This is the beginning  
3 of Media Number 4. Going back on the record,  
4 1:19 p.m.

5 BY MR. KLATT:

6 Q. Good afternoon, Dr. Gardener. We've had a  
7 lunch break for a little while. Correct?

8 A. Correct.

9 Q. Before the lunch break, in questioning  
10 this morning I had asked you questions about a  
11 presentation you'd made regarding PFAS that you  
12 testified to that you made earlier this year. And  
13 then I asked you some follow-up questions about  
14 PFAS that you were instructed not to answer.

15 We've had a discussion off the record, and  
16 I'm going to go back and ask the court reporter to  
17 read those questions that you were instructed not  
18 to answer and I'm going to ask you to answer those  
19 to the best of your ability on the record.

20 A. Okay. I wasn't sure which presentation  
21 you were asking about.

22 MR. KLATT: We're not on the record yet?

23 THE VIDEOGRAPHER: We are on the record.

24 Q. You had mentioned earlier this morning  
25 that there was some presentation you had made

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1 regarding PFAS. So I was asking you follow-up  
2 questions. You would know better than I what  
3 presentation you were referring to.

4 A. I don't remember which -- I don't remember  
5 the context about which presentation. But just  
6 general presentations that I've made about PFAS?

7 MR. KLATT: Why don't we go off the  
8 record.

9 THE VIDEOGRAPHER: Off the record,  
10 1:20 p.m.

11 (Recess, 1:20 p.m. to 1:25 p.m.)

12 THE VIDEOGRAPHER: On the record,  
13 1:25 p.m.

14 Please proceed.

15 BY MR. KLATT:

16 Q. Dr. Gardener, we took a short break to go  
17 back and figure out when we -- this whole subject  
18 of PFAS first came up in the deposition this  
19 morning, and the court reporter read back to you  
20 that testimony.

21 Now I'm going to ask her to read the first  
22 question you were instructed not to answer, and I  
23 would ask that you answer that, subject to any  
24 objection.

25 MR. KLATT: Could you go ahead and read

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1 that question about PFAS.

2 (Record read)

3 MR. ESFANDIARY: Objection, beyond the  
4 scope.

5 You can answer.

6 A. I am not prepared to offer opinions about  
7 PFAS in relation to autism and ADHD. I haven't  
8 really studied that.

9 Q. Based on -- well, let me back up.

10 What was your presentation about? Because  
11 you did reference some sort of nerve developmental  
12 consequences of PFAS as part of your presentation.

13 What did that entail?

14 A. Yeah. So I remember there was a slide  
15 showing basically all that we know about, like,  
16 how PFAS affects different sorts of health  
17 outcomes. And there may have been things about  
18 neurodevelopmental outcomes on there.

19 The point of the slide was to basically  
20 say there's been all this, you know, research on  
21 PFAS in relation to so many different health  
22 outcomes. I'm including some of the ones I'm  
23 looking at.

24 So in my grant I'm looking at the  
25 association between PFAS and lipid profiles. And

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1 it's really well understood now that increased  
2 exposure to PFAS deleteriously impacts lipid  
3 profiles.

4 But what is really much less known is how  
5 PFAS impacts atherosclerosis, carotid  
6 atherosclerosis, which impacts the delivery of  
7 blood to your brain.

8 And there have been no prospective  
9 longitudinal studies, really no, like, strong epi  
10 studies on PFAS in relation to dementia, in  
11 relation to late-life cognitive impairment and  
12 cognition in general, and talking about how that  
13 is a substantial gap in the literature that my  
14 grant is going to fill, is starting to fill.

15 Q. In coming to your opinions in this case  
16 about lead and arsenic in autism, ADHD, what  
17 methodology have you employed to rule out any  
18 potential role of PFAS as a cause of ADHD or ASD  
19 in infants or young children?

20 A. It's not necessary to rule out PFAS as a  
21 cause of these things.

22 For example, so this whole week, other  
23 than today, I'm attending the Alzheimer's  
24 Association meeting. It's the biggest Alzheimer's  
25 Association meeting that happens annually.

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1 This week it's in Toronto, and there are  
2 so many lecturers talking about how diet impacts  
3 dementia, how exercise, how sleep, the gut  
4 microbiome, there's lectures about how heavy  
5 metals impact dementia risk.

6 None of that necessitates ruling out PFAS.  
7 Nobody is like, whoa, we can't actually say  
8 anything about exercising in relation to dementia  
9 risk because Hannah Gardener's study on PFAS  
10 hasn't ruled out PFAS.

11 It is very well understood that dementia  
12 is multifactorial, that there's so many causes of  
13 dementia, including genetics and including  
14 environmental, lifestyle exposures.

15 And talking about the causality of those  
16 exposures does not mean that we have ruled out the  
17 impact of PFAS.

18 The exact same is true for autism. We  
19 don't need to rule out or rule in PFAS as a  
20 causal -- as a cause of autism in order to say  
21 that lead and arsenic exposure causes autism or  
22 ADHD.

23 I think it's probably very well understood  
24 that we knew that smoking causes lung cancer  
25 before we really understood that radon also causes

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1 lung cancer.

2 The fact that radon causes lung cancer  
3 does not mean that smoking doesn't cause lung  
4 cancer or that smoking definitely causes lung  
5 cancer.

6 All these sort of chronic diseases are  
7 well understood to be multifactorial.

8 I don't need to write a whole expert  
9 report on PFAS in relation to autism in order to  
10 say with confidence that my opinion is that lead  
11 and arsenic exposure are causally associated with  
12 autism and ADHD.

13 Q. Being an expert, as you've indicated, on  
14 environmental causes for neurologic diseases,  
15 based on your scientific knowledge base and  
16 opinion, do you think it's possible that PFAS may  
17 be causing or contributing to ASD or autism?

18 MR. ESFANDIARY: Objection, beyond the  
19 scope of Dr. Gardener's opinion and testimony in  
20 this case.

21 A. I am not prepared to opine here under  
22 oath, something I take really, really seriously.

23 MR. ESFANDIARY: Please don't interrupt  
24 her.

25 Q. We'll take that for granted. But go

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1 ahead.

2 A. I am not prepared here to provide expert  
3 witness opinions about PFAS in relation to autism  
4 and ADHD.

5 You want to ask me about PFAS in relation  
6 to dementia? I have done that level of research.

7 Q. Did any of the studies that you rely on  
8 for your opinions about lead and arsenic being  
9 potential causes of ASD or ADHD, did any of those  
10 studies examine potential alternative chemicals  
11 like PFAS or phthalates?

12 A. I would have to go back and look. Many of  
13 the studies did look at chemicals beyond lead and  
14 arsenic.

15 For example, a lot of them included other  
16 metals in their analyses. Other studies did look  
17 at other chemicals, but I don't remember sort of  
18 which ones looked at which.

19 That wasn't sort of the aspect of the  
20 studies that I was including in my report, so I  
21 can't refer to my report in -- I might have some  
22 mention of in quoting reports to sort of say which  
23 studies looked at which.

24 I would say most of them didn't just look  
25 at lead or didn't just look at arsenic. Most of

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1 them did actually measure multiple compounds.  
2 Q. Do you recall any looking at the potential  
3 effects of PFAS as a cause of either ASD or ADHD?

4 A. Did any measure PFAS? I can't recall.  
5 It's possible that none of these ones did.

6 Q. And same question about phthalates. Do  
7 you recall any studies that you cited in your  
8 report concerning lead and arsenic in ASD or ADHD,  
9 did any of those studies, to your recollection,  
10 evaluate the potential for phthalates to be a  
11 cause of ASD or ADHD?

12 A. I don't recall. But again, it is assumed  
13 that, even from an environmental toxin standpoint,  
14 that my opinions about lead and arsenic causing  
15 ASD and ADHD don't require that other  
16 environmental toxins also cause these, nor does  
17 the fact that other environmental toxins causing  
18 these rule out the fact that lead and arsenic --  
19 one of the Hill criteria is, you know, do -- have  
20 these metals caused related neurodevelopmental  
21 outcomes or similar outcomes and do other related  
22 compounds cause ASD and ADHD.

23 And there is sort of -- there is that  
24 analogy. But that's not a requirement. It's not  
25 a requirement that other similar compounds cause

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1 these outcomes for lead and arsenic to also cause  
2 these.

3 And these are not the same -- phthalates  
4 are not heavy metals. PFAS are not heavy metals.  
5 They're distinct compounds.

6 Q. Do you agree that to determine whether the  
7 exposure to ASD in a particular child has caused  
8 ASD or ADHD, you'd also need to consider other  
9 factors like phthalates and PFAS?

10 A. So that's an issue of specific causation  
11 that's not part of my charge. What I look at is  
12 on a population-wide level.

13 On a population-wide level we don't need  
14 that. We know that lead and arsenic can cause ASD  
15 and ADHD even when there are other causes of those  
16 as well.

17 In terms of the methodologies of specific  
18 causation, that's not part of my charge. And I  
19 should not be opining on that methodology.

20 Q. Do you think it would be important to  
21 consider other factors as alternative causes for  
22 ASD or ADHD in a particular child?

23 MR. ESFANDIARY: Objection, beyond the  
24 scope.

25 A. That's not really -- that's not, like,

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1 part of my charge. As an epidemiologist, I'm  
2 trained to think about this on a population-wide  
3 level.

4 Of course on a population-wide level we  
5 expect that these outcomes are multifactorial. We  
6 understand that there are many environmental  
7 toxins as well as genetic factors that contribute  
8 to the causation of these outcomes, just like it's  
9 very intuitive, I think, for people to understand  
10 that stroke and dementia, which I study all the  
11 time, are multifactorial.

12 Just because blood pressure is very, very  
13 important in terms of stroke etiology does not  
14 mean that smoking isn't, doesn't mean that alcohol  
15 consumption isn't, and it doesn't mean that PFAS  
16 might be as well. We don't have that strong  
17 evidence yet.

18 There's suggested links with stroke, but  
19 it's not like we don't study PFAS as a potential  
20 risk factor for stroke just because we know that  
21 smoking and high blood pressure and diabetes cause  
22 stroke.

23 Q. What methodology do you use when you're  
24 looking at studies on a population level to rule  
25 out things like phthalates and PFAS and brominated

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1 flame retardants, for example, as potential causes  
2 of autism or ADHD?

3 A. On a population-wide level, if I were to  
4 rule it out, I would look at the evidence.

5 Q. And have you done that in this case?

6 A. Sorry. Have I done what?

7 Q. Looked at the evidence on the potential  
8 causation of autism -- excuse me. Start over.

9 Have you looked in this case at the  
10 potential causation of PFAS, phthalates, or  
11 brominated flame retardants, for example, to rule  
12 them out as causes of autism or ASD on a  
13 population level?

14 A. As part of this case, no. So my role in  
15 this case is to consider the evidence for  
16 causation for lead and arsenic. That is  
17 irrelevant, whether brominated flame retardants or  
18 PFAS or phthalates, organotins are ruled in or  
19 ruled out. It is irrelevant to lead and arsenic.

20 So if we ruled -- if someone ruled those  
21 in, that doesn't mean that my evidence about lead  
22 and arsenic is not also present.

23 So for example, if we're trying to think  
24 about does smoking cause lung cancer or not, you  
25 can make that causal determinant without ruling in

1 or ruling out radon. You want to consider it.  
 2 You want to think about it, especially if the two  
 3 things were perfectly correlated, which we know  
 4 that they're not.

5 The fact that radon causes lung cancer  
 6 does not actually mean that smoking does or does  
 7 not cause lung cancer. We have to look at the  
 8 literature on smoking.

9 So my charge here had nothing to do, was  
 10 not particular to those other chemicals. And it's  
 11 not -- they're not so closely related where, you  
 12 know, oh, if the literature said to me, you know  
 13 what, we can't say that PFAS causes autism. That  
 14 would not make me be like, oh, you know, lead and  
 15 arsenic can't cause autism.

16 Q. Using your example of lung cancer, I think  
 17 you've pointed out not all causes -- not all lung  
 18 cancers are caused by smoking. Correct?

19 A. There are plenty of people who get lung  
 20 cancer who never smoked. I mean, according to the  
 21 data.

22 So for those people, they did not smoke,  
 23 so smoking could not have caused their lung  
 24 cancer.

25 I mean, secondhand smoke for those people,

1 sure. They could have. But smoking is not a  
 2 necessary cause of lung cancer. You can get lung  
 3 cancer and never have smoked a cigarette in your  
 4 entire life.

5 Q. Nor is lead or arsenic a necessary cause  
 6 of autism or ADHD. Correct?

7 A. That's a hypothetical. There are many  
 8 people who have never once smoked a cigarette. I  
 9 haven't seen a large scale study of, you know --  
 10 of autism and ADHD in which, you know, everyone  
 11 has a blood lead level of zero, you know.

12 So that's a question that's left to be  
 13 determined. That wasn't actually part of my  
 14 charge.

15 As I spoke -- as I wrote about in my  
 16 report, it may -- when we're talking about  
 17 specific causation -- my report saying that lead  
 18 and arsenic can cause autism on a population-wide  
 19 basis does not mean -- does not indicate how  
 20 etiologically relevant it is for each and every  
 21 child.

22 That's an issue of specific causation, and  
 23 that's not part of my charge. And that would  
 24 require, you know, considering all sorts of  
 25 history, life history and exposures for those

1 individual children.

2 Q. And exposures like phthalates, PFAS, and  
 3 brominated flame retardants. Correct?

4 MR. ESFANDIARY: Objection, beyond the  
 5 scope.

6 A. I can't say that. I'm not here saying  
 7 those are all risk factors for autism and ADHD.

8 That's not part of my charge here, just  
 9 like what I can say confidently on a  
 10 population-wide basis, we can say that lead and  
 11 arsenic cause autism and ADHD, in the absence of a  
 12 convincing body of literature on so many different  
 13 compounds, just like we epidemiologists came to  
 14 say smoking causes lung cancer, even in the  
 15 absence of -- back in those days, we didn't know  
 16 anything about PFAS. PFAS was just starting to be  
 17 used.

18 That doesn't mean that we're now not able  
 19 to say that PFAS causes -- that smoking causes --  
 20 we're not reconsidering whether smoking causes  
 21 lung cancer because of lack of data on PFAS.

22 Q. Is it your belief that all causes of  
 23 autism and ASD are the result of lead or arsenic  
 24 exposure?

25 A. That question makes no sense. Sorry.

1 Do you want to rephrase it?

2 Q. Is there a group in the population that  
 3 has ASD and ADHD for which lead or arsenic was not  
 4 a cause?

5 MR. ESFANDIARY: Objection, calls for  
 6 speculation.

7 A. I would say that's an issue of specific  
 8 causation. I mean, I'm here to talk about on a  
 9 population-wide level.

10 Q. That's not what I'm asking --

11 MR. ESFANDIARY: Don't interrupt her.

12 Q. That's what I'm asking you. I'm asking  
 13 you on a population level whether you think there  
 14 is a group of children whose ASD and/or ADHD has  
 15 nothing to do with exposure to lead or arsenic.

16 MR. ESFANDIARY: Calls for speculation.

17 A. I'm here to say that lead and arsenic are  
 18 causally associated with autism and ADHD.

19 How relevant they are for each individual  
 20 person, that's an issue of specific causation. In  
 21 the epidemiology world, we think about a time  
 22 machine, like, could we go back and create that  
 23 hypothetical child and have, you know, there be no  
 24 lead and arsenic in this world and would that  
 25 child still get autism.

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1 That's more of a theoretical concern for  
 2 epidemiologists that was not part of my charge.  
 3 My charge was to look at on a  
 4 population-wide basis, are lead and arsenic  
 5 causally associated with ASD and ADHD. And, you  
 6 know, I can read you my opinion, but they are,  
 7 yes.

8 Q. As part of your methodology in arriving at  
 9 your conclusions in this case, did you consider  
 10 that there are population-level segments whose ASD  
 11 and ADHD was not caused by exposure to lead or  
 12 arsenic?

13 A. So the fact that lead and arsenic cause  
 14 ASD and ADHD does not mean that they have to be  
 15 etiologically relevant for everyone. Just like  
 16 smoking causes lung cancer, but that doesn't mean  
 17 that it's etiologically relevant for everyone.

18 We know that high blood pressure is so  
 19 etiologically relevant for stroke on a  
 20 population-wide level, but that doesn't mean that  
 21 you can't have a stroke with very low blood  
 22 pressure.

23 Sadly, it would be great, you know, if  
 24 just because a really strong exposure for an  
 25 outcome like hypertension and stroke meant that

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1 mean, it would be so great if we could wipe out,  
 2 you know, lead and arsenic from baby food.

3 We see that levels have decreased over  
 4 time because companies are getting more  
 5 responsible, but that doesn't mean that, you know,  
 6 if we completely wiped out lead and arsenic from  
 7 baby food that nobody is going to have arsenic --  
 8 nobody is going to have ASD and ADHD.

9 I don't think that that would be true.  
 10 But they are so causally relevant that lead and  
 11 arsenic are causally associated with ASD and ADHD.

12 Q. Let me follow up on that. If it were  
 13 feasible to make all baby foods commercially  
 14 produced or homemade baby foods completely lead  
 15 free, arsenic free, do you think that children,  
 16 infants, children, babies in utero, would still be  
 17 exposed to lead and arsenic from other sources in  
 18 the environment other than food?

19 MR. ESFANDIARY: Objection, incomplete  
 20 hypothetical, calls for speculation.

21 A. That's a hypothetical. I mean, it would  
 22 be great. You know, I hope one day -- I know that  
 23 the lead and arsenic levels are going down because  
 24 we know it's feasible. We know that companies  
 25 could have been reducing their levels of lead and

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1 you couldn't get stroke without it, that would  
 2 make -- that would make so many people like me who  
 3 don't have high blood pressure rest easy at night.  
 4 Then I could say, oh, guess what? I don't have  
 5 the ability to get stroke.

6 Sadly, it does not work that way.

7 MR. KLATT: Object to nonresponsiveness of  
 8 the answer.

9 A. Do you want to ask the question in another  
 10 way?

11 Q. Do you believe that lead and/or arsenic  
 12 exposure is a necessary cause of ASD and ADHD?

13 A. I believe that lead and arsenic exposure  
 14 on a population-wide level causes ASD and ADHD.

15 That does not mean that you can -- that  
 16 you need to be exposed to those to get autism and  
 17 ADHD. Just like what I was saying, you don't need  
 18 to have high blood pressure in order to get a  
 19 stroke. You don't need to smoke in order to get  
 20 lung cancer.

21 We know that smoking is so important for  
 22 lung cancer, but that does not mean that it's --  
 23 that it's necessary, that you can't get lung  
 24 cancer without smoking.

25 It would be so great if that were true. I

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1 arsenic in baby food all along. It should not  
 2 have waited until recently to go down.

3 But there's a long way to go. Baby food  
 4 is still contaminated with lead and arsenic. So  
 5 what you're describing is a hypothetical future  
 6 situation in which there needs to be lead and  
 7 arsenic removed from other things too.

8 Would that happen simultaneously? Who  
 9 knows.

10 Q. Is it your testimony that the only source  
 11 of lead and arsenic exposure to infants and young  
 12 children is from baby food and no other source?  
 13 Is that what you're testifying to today?

14 A. I'll read you from my report because I  
 15 talk in my report about where lead can be found  
 16 and where arsenic can be found.

17 Q. My question is other than baby food.

18 A. Yes. I understand your question.

19 So on page 33 of -- these have got  
 20 different labels. Now this says Gardener 2.

21 Q. That's the correct exhibit number.

22 A. Yeah. It just didn't have my name before.  
 23 Now it has my name on there.

24 Now in Exhibit Gardener 2, on page 39 of  
 25 my report.



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1 Q. Hang on just a second. Let me get there.

2 Okay. Go ahead, Dr. Gardener.

3 A. On the bottom of page 33, lead is a heavy  
4 metal found in many sources including paint,  
5 pipes, ceramics, bullets, crystal, soldiers --  
6 solders --

7 Q. Solders?

8 A. Yes, solders.

9 -- gasoline, antiques, and cosmetics and  
10 contaminates soil, dust, water and food.

11 Q. So if we excluded arsenic and lead from  
12 food, we'd still be all exposed, including infants  
13 and children, to arsenic in soil, dust, and water.  
14 Correct?

15 A. So what you're talking about is a  
16 hypothetical future. We don't know. Maybe at  
17 that time of that hypothetical future the other  
18 sources would have been eliminated too. I hope we  
19 get to see that time when the baby food  
20 manufacturers, you guys are reducing the exposure.

21 The exposure has also been reduced in  
22 other areas too; for example, paint and toys. The  
23 exposure to lead from those sources are also  
24 decreasing.

25 You're presenting a hypothetical future.

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1 they also come in contact with it from food,  
2 because food is grown in soil.

3 MR. KLATT: Object to --

4 Q. Go ahead.

5 A. It is possible that you have a  
6 hypothetical child that doesn't eat. That doesn't  
7 mean that that child is not going to be exposed to  
8 heavy metals in soil.

9 Q. Okay. Listen to my question carefully,  
10 Dr. Gardener. I'm simply asking about soil, not  
11 about food.

12 Can a child, an infant crawling around, be  
13 exposed to lead and arsenic from direct contact  
14 with soil?

15 MR. ESFANDIARY: Objection, calls for  
16 speculation, overbroad.

17 A. It depends on the child. But some  
18 children are exposed to lead from soil.

19 Q. Are some children exposed to lead from  
20 water?

21 A. Some children are exposed to lead from  
22 water.

23 Q. Are some children exposed to arsenic from  
24 water?

25 A. Some children are exposed to arsenic from

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1 Q. I'm not presenting -- go ahead. I'm not  
2 presenting anything hypothetical. I'm looking at  
3 what you just read.

4 You said, "Lead is a heavy metal found in  
5 many sources and it contaminates soil, dust, and  
6 water."

7 That's apart from food. Correct?

8 A. Yes, but it's also -- and part of the  
9 contamination of food is because of contamination  
10 from soil and water.

11 Q. But --

12 A. So, you know, it will be much harder to  
13 eliminate it from food without eliminating it from  
14 soil and dust. So you're talking about a  
15 hypothetical future where we have figured out how  
16 to totally eliminate it from food despite its  
17 continued presence in soil and water. That's a  
18 hypothetical.

19 Q. Well, let's ask about a real-world  
20 example.

21 Can children, including infants, come into  
22 direct contact with lead and arsenic from contact  
23 with soil?

24 A. Children can and do come into contact with  
25 lead from soil. And that's part of the reason why

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1 water. And again, both -- water is a contributor  
2 to food, so that's part of the reason why food is  
3 contaminated.

4 Q. For example, if water is used to make  
5 infant formula, a child may be exposed to lead or  
6 arsenic in the water used to make infant formula.  
7 Correct?

8 A. Yes. So some of the infant formula,  
9 those -- the jugs of infant formula, the source of  
10 that lead or arsenic may be from the water or from  
11 the ingredients outside the water, the formula  
12 ingredients itself.

13 And same with food. They could be -- it  
14 could be from different parts of the food, the  
15 ingredients, including water.

16 Q. All right. But my question is confined to  
17 simply water exposure. Can children be exposed to  
18 lead and arsenic simply from coming into contact  
19 with or ingesting water?

20 A. Some children are exposed to lead and  
21 arsenic from water. Lead and arsenic are both  
22 contaminants in some water sources, so children  
23 can be exposed to lead and arsenic from water.

24 Q. Now let's look at the other example that  
25 you read from your report, dust.



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1 Can infants and children in the U.S. be  
2 exposed to lead and arsenic through coming into  
3 contact with dust, whether inside or outside the  
4 home?

5 A. Some children are exposed to lead and  
6 arsenic inside and outside the home from dust.

7 Q. I want to talk to you for a minute about  
8 something that I brought to your counsel's  
9 attention right before the lunch break, and that  
10 was your testimony in front of the Rhode Island  
11 Senate --

12 MR. ESFANDIARY: Do you have an extra  
13 copy?

14 MR. KLATT: I do. In fact, the court  
15 reporter courteously marked that as Exhibit 8.

16 (Exhibit 8 marked for identification)

17 Q. First of all, let's establish,  
18 Dr. Gardener, you recall testifying in front of  
19 the Rhode Island State Senate in March of 2017  
20 about brominated flame retardants?

21 A. I do.

22 Q. What brought that testimony about?

23 A. So I was hired by an organization to  
24 deliver this testimony. They -- I don't know what  
25 the right words were. I don't know if they were

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1 in support of the bill or they were a driving  
2 force. I don't really -- I don't know really how  
3 that all works. Its senate representatives, I  
4 guess, are the ones that bring the bill forth.

5 The organization Clean Water Rhode  
6 Island -- I can't remember -- it was like Clean  
7 Water Rhode Island or something. They found me  
8 and they told me about this bill that they -- that  
9 was going before the senate and the house in Rhode  
10 Island about restrictions for -- that all  
11 brominated -- yeah, all brominated flame  
12 retardants. And they asked me to testify.

13 Q. And were you put under oath? Do you  
14 recall?

15 A. Probably.

16 Q. If you don't remember -- if you don't  
17 remember --

18 A. I think in those situations -- actually, I  
19 don't actually recall whether you get put under  
20 oath or not for that.

21 Q. And you're aware that your statement is on  
22 YouTube now?

23 A. The video. There's a video of me.

24 Q. Yes.

25 A. That wonderful video of me. I had the

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1 flu, so . . .

2 Q. Have you reviewed it recently?

3 A. I have watched bits of it and cringe  
4 because I was so sick and I look quite ill, I  
5 think.

6 Q. Well, it wasn't apparent to me watching  
7 it.

8 I've transcribed it here. We can call it  
9 up and go through it. It's about seven minutes.

10 I'll represent to you that this is an  
11 accurate transcription. And you're free to  
12 disagree with anything here if you have a basis  
13 now in 2025 to disagree.

14 But I direct your attention to the third  
15 paragraph. And you said back in 2017, "A 2011  
16 study of baby products found that 80 percent of  
17 products tested contained a halogenated flame  
18 retardant additive."

19 Do you recall that?

20 A. Do I recall saying that sentence?

21 Q. Yeah.

22 A. No. That was eight years ago, so I don't  
23 recall. I'm not disputing that I didn't say that.  
24 It's just a sentence I said eight years ago. I  
25 don't remember if I said that sentence or not.

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1 Q. Do you recall the 2011 study of baby  
2 products that found 80 percent of them contained a  
3 halogenated flame retardant additive?

4 A. I do not recall that study.

5 Q. And then you went on to say, "Flame  
6 retardants are not physically bound to the  
7 products in which they are applied. They migrate  
8 out of the home products and into the air in homes  
9 and accumulate in house dust."

10 Is that an accurate statement, to your  
11 knowledge, as we sit here today?

12 MR. ESFANDIARY: Objection, beyond the  
13 scope.

14 A. That sentence makes a lot of sense to me.  
15 I'm not here sort of prepared -- I did not think I  
16 would be providing any opinions today about flame  
17 retardants.

18 Q. I'm just asking about opinions that you  
19 expressed to the Rhode Island State Senate in  
20 2017. You don't have any reason to dispute that,  
21 do you?

22 A. I don't have reason to dispute this. No.

23 Q. And then you go on to say, "People are  
24 exposed through inhalation, by ingesting with  
25 ingestion when dust gets on our hands and

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1 therefore into our mouths and through the skin."

2 Correct?

3 A. That's what this says. It sounds very  
4 inarticulate. But if that's how I said that,  
5 that's how I said that.

6 Q. Is it true that lead and arsenic can get  
7 into the human body, whether in a child or an  
8 adult, through inhalation and by dust getting on  
9 their hands and into their mouths and through the  
10 skin?

11 MR. ESFANDIARY: Objection, beyond the  
12 scope.

13 MR. KLATT: I'm asking about lead and  
14 arsenic.

15 MR. ESFANDIARY: I'm sorry. Go ahead.

16 A. Inhalation, definitely. Dermal exposure  
17 at least for lead is more challenging. Inhalation  
18 is definitely an important exposure source. And I  
19 would say that's true for arsenic too. The data  
20 on dermal exposure with lead I would say is a  
21 little bit --

22 MR. ESFANDIARY: Hey, Mike, we don't have  
23 to leave the room. I just need to use the  
24 restroom quickly.

25 MR. KLATT: Do you want to go off the

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1 record and take a break?

2 MR. ESFANDIARY: Just two minutes. I  
3 don't want to eat up time here.

4 THE VIDEOGRAPHER: That concludes the  
5 Media Number 3 [sic]. Going off the record at  
6 2:01 p.m.

7 (Recess, 2:01 p.m. to 2:04 p.m.)

8 THE VIDEOGRAPHER: This is the beginning  
9 of Media Number 5. Going back on the record,  
10 2:04 p.m.

11 BY MR. KLATT:

12 Q. Dr. Gardener, I'm picking up again after  
13 our short break with Exhibit 8, which is the  
14 transcription of your Rhode Island Senate  
15 testimony in March of 2017.

16 And I'm going to the next sentence, which  
17 says, "Babies and children are more highly exposed  
18 as they spend more time crawling and playing on  
19 the floors and have increased hand-to-mouth  
20 contact." Correct?

21 A. Correct.

22 Q. And do you believe that to be true?

23 A. Well, so I was talking about more exposed  
24 to halogenated flame retardant that migrates out  
25 of the products. And, I mean -- yeah. I'm not

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1 disputing that.

2 Q. Do you agree that babies and children are  
3 more highly exposed to both lead and arsenic as  
4 they spend more time crawling and playing on  
5 floors and have increased hand-to-mouth contact?

6 A. That's definitely true. I mean, first of  
7 all, they're more exposed than adults in general,  
8 especially to lead.

9 In this context, we tend to think about  
10 lead more in this context than arsenic. But to  
11 the extent that arsenic would be in house dust --  
12 basically, babies and children tend to be more  
13 exposed to house dust than adults because they're  
14 crawling around, they're playing more on the  
15 floor, and they have all this hand-to-mouth  
16 contact.

17 Q. Are you aware of the EPA, federal  
18 government's EPA, stating that house dust is the  
19 most frequent source of lead exposure to infants  
20 and young children?

21 A. Can you show me where that is?

22 Q. Sure. Well, I will come to that. Let's  
23 finish up with Exhibit 8, and I'll come to that in  
24 a minute.

25 And then going back to Exhibit 8 and

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1 referring to your testimony about flame  
2 retardants, you say, "In addition, they" --  
3 meaning, I assume, babies and children -- "are  
4 also exposed through their breast milk."

5 And you're talking about flame retardants  
6 there. Correct?

7 A. Correct.

8 Q. Is it also true that babies are exposed to  
9 lead and arsenic through breast milk, nursing?

10 MR. ESFANDIARY: Objection, overbroad,  
11 calls for speculation.

12 A. I would need to look -- I haven't looked  
13 at data at all recently about the amount of lead  
14 and arsenic in breast milk. But in general, those  
15 can be exposure sources depending on the  
16 mother's . . .

17 Q. As part of formulating your opinions in  
18 this case, did your methodology include ruling out  
19 the role that lead or arsenic exposure in breast  
20 milk may play in what you believe to be children  
21 developing ASD or ADHD as a consequence of lead or  
22 arsenic exposure?

23 A. I ruled it in. My opinion is that lead  
24 and arsenic exposure do -- are causally associated  
25 with ASD and ADHD. I didn't rule that out. I

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1 ruled that in irrespective of their exposure  
2 source.

3 Q. Okay. And one exposure source would be  
4 breast milk. Correct?

5 A. It can be for some children. And plenty  
6 of children don't breast-feed, so it really  
7 depends -- it's a hypothetical.

8 It depends on the amount of lead and  
9 arsenic contamination in the breast milk, whether  
10 the baby breast-feeds, how long, how much. But  
11 yeah, absolutely. My opinion in this case is that  
12 lead and arsenic are causally associated with  
13 autism and ADHD.

14 Q. And we earlier talked about how those  
15 exposures to lead and arsenic can even occur to  
16 children in the nine months that they're in the  
17 womb before birth. Correct?

18 MR. ESFANDIARY: Objection, overbroad,  
19 calls for speculation.

20 A. So we're switching away from breast -- so  
21 they're not breast-feeding in the womb --

22 Q. Absolutely.

23 A. -- but they're still exposed to -- and  
24 breast milk is made from the mother's blood and  
25 they are exposed to the mother's blood.

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1 I should say the blood of anyone who's  
2 breast-feeding them. It does not necessarily need  
3 to be their mother.

4 So yes, when they are exposed to blood  
5 from their mother in the womb, that can be  
6 contaminated with lead and arsenic.

7 Q. So babies in the United States or anywhere  
8 in the world, for that matter, can be exposed to  
9 lead and arsenic through the mother's blood for  
10 the nine months of gestation and then for the  
11 first three or four months of either infant  
12 formula or breast-feeding before they ever  
13 encounter baby food, solid baby food, whether  
14 commercially prepared or homemade. Correct?

15 MR. ESFANDIARY: Objection, overbroad.

16 A. So I testified and studied the  
17 contamination of infant formula with heavy metals.  
18 And I think that that's absolutely health  
19 relevant.

20 It's not that lead and arsenic from  
21 certain exposures are not important, not  
22 etiologically relevant and they are etiologically  
23 relevant from other exposures. It does not  
24 matter. What matters is that they are exposed to  
25 lead and arsenic.

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1 Just like I study PFAS. And there's all  
2 this accumulating evidence about all the  
3 deleterious health effects of PFAS. Nobody, not  
4 once in all of my talks, all the talks I've seen,  
5 all of the talks I've given, all the conversations  
6 I've had, the PFAS from the couches don't matter.  
7 The PFAS from this chair, it doesn't matter. The  
8 PFAS from this water doesn't matter.

9 It's PFAS. It all matters. Nobody cares  
10 from an etiological perspective where the PFAS is  
11 coming from. That's not relevant.

12 What's relevant is the exposure. How  
13 much, what are the different types of PFAS  
14 compounds, because there are thousands of them.  
15 The exposure source, just like for lead and  
16 arsenic, does not matter. It is that you are  
17 being exposed, how much, when.

18 Q. So let me go back to my question.

19 For the nine months that a baby's in  
20 gestation before birth and then for the four to  
21 six months that the infant is alive and feeding  
22 either through breast milk or infant formula  
23 before it ever encounters commercial or homemade  
24 baby food, for that 13- to 15-month period from  
25 conception until it starts eating, he or she

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1 starts eating commercial or homemade baby food,  
2 that child is being exposed to lead and arsenic?

3 A. First of all, some babies start eating  
4 before four months, and a lot of babies wait until  
5 long after four months to start eating baby food.  
6 So I want to clarify that.

7 But as I talked about in my -- written  
8 about in my report and talked about today, there  
9 are many sources of exposure for lead and arsenic.

10 And my opinions are really centered around  
11 postnatal exposure to lead and arsenic. But I  
12 also brought in some discussion, although not as  
13 rigorous as a whole report, on the impacts of  
14 prenatal exposure to lead and arsenic, but I did  
15 also bring that up.

16 But it is clear that there are multiple  
17 exposure sources, Number 1. And Number 2, the  
18 exposure source doesn't matter.

19 What matters is that the baby is being  
20 exposed. And whether it's because they were  
21 chewing the paint from the windowsill or if the  
22 paint from the windowsill chipped off and was in  
23 the dust and it got into their mouths from the  
24 dust or from their food, it does not matter.

25 What matters is their exposure. Nobody

1 outside of -- really cares about what the exposure  
2 source is but rather how much is being exposed.

3 From an etiological perspective, where it  
4 really matters what the exposure source is, the  
5 exposure source matters in that it helps us figure  
6 out where do we devote our energy to reduce and  
7 eliminate the exposure.

8 So it's not that it matters from the  
9 health consequences but rather from the solution.

10 Q. I think maybe you misunderstood my  
11 question or got sidetracked. I have a very  
12 specific question. I understand that you think  
13 the source of lead or arsenic exposure doesn't  
14 matter. I'd like to shift to the time frame of  
15 lead and arsenic exposure.

16 It is a true fact that babies in the  
17 United States and around the world are exposed to  
18 lead and arsenic for nine months during gestation  
19 before they're even born and then for the two to  
20 four to six months, however long before they ever  
21 start eating either commercial or homemade baby  
22 food. Correct?

23 MR. ESFANDIARY: Objection, overbroad,  
24 calls for speculation.

25 A. So as I talked about in this report, baby

1 food is not the only exposure source to lead and  
2 arsenic. Typically babies are exposed -- people  
3 are exposed throughout their entire lives,  
4 starting at conception. In general, there is  
5 exposure.

6 That does not mean -- just because you're  
7 exposed prenatally does not mean that your  
8 postnatal exposure to lead and arsenic is not  
9 etiologically relevant, just like just because  
10 you're exposed postnatally does not mean your  
11 prenatal exposure is irrelevant.

12 I've been in litigation about infant  
13 formula. And they make this huge, big deal, oh,  
14 the exposure to the infant formula doesn't matter.

15 Our baby food is filled with lead and  
16 arsenic. It's all -- the babies are not just --  
17 they're not just consuming infant formula.  
18 They're also eating all this heavily contaminated  
19 baby food as if -- that doesn't mean that the  
20 contamination in infant formula is irrelevant.

21 And I'll say that again in this situation.  
22 Just because your breast milk and infant formula  
23 and in utero exposures are present does not mean  
24 that the exposure to baby food or in general to  
25 children and babies is not etiologically relevant.

1 MR. KLATT: Object to the responsiveness  
2 of the answer, everything after "there are many  
3 sources of exposure for lead and arsenic."

4 Q. Let's focus, if you would, Dr. Gardener --  
5 I'm focused on the time period. I understand your  
6 opinion is there are a lot of different sources of  
7 lead and arsenic exposure. I understand you  
8 believe they can occur postnatally. I'm focused  
9 on the time period.

10 You agree with me that babies in the  
11 United States and elsewhere are exposed to lead  
12 and arsenic for the nine months of gestation  
13 before birth and for the three, four, five, six  
14 months before they ever encounter commercial baby  
15 food. Correct?

16 MR. ESFANDIARY: Objection, overbroad,  
17 calls for speculation.

18 Q. Focusing just on the time period.

19 A. Sorry. Can you repeat the question?

20 (Pending question read)

21 A. Yes. So there's definitely, you know --  
22 for most children -- I can't say for every single  
23 child out there. But in general, babies are  
24 exposed to lead and arsenic prenatally.

25 I talked about that in my report, studies

1 on prenatal exposure to lead and arsenic in  
2 relation to ASD and ADHD as well as during  
3 infancy.

4 I've been involved in litigation about  
5 heavy metal contamination in infant formula. And  
6 it's not just infant formula. Babies and children  
7 are exposed to heavy metals from other sources  
8 during infancy as well.

9 Q. And did you make any effort in the  
10 methodology you used to come to your opinions in  
11 this case to rule out these other sources of  
12 exposure to lead and arsenic that babies and  
13 infants have before they ever encounter commercial  
14 baby food?

15 A. So I talked about that in my report. I  
16 talked about studies on prenatal exposure to lead  
17 and arsenic. I considered that. I talked about  
18 that. I talked about the fact that that -- that  
19 it might -- the data from there might be slightly  
20 outside of the etiologically relevant window that  
21 we're talking about in this case. But it can help  
22 inform our opinions about temporality.

23 Q. We've already established today that the  
24 gestation period an infant undergoes for nine  
25 months is a critical time in terms of

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1 neurodevelopment. Correct?

2 A. There are neurodevelopmental processes  
3 that occur in utero as well as for years and years  
4 after birth.

5 You know, there's neurogenesis going on  
6 right now. The stress that I'm feeling today is  
7 actually impacting my brain architecture and yours  
8 probably too. Maybe you're not as stressed out  
9 from this; this is part of your job. But all of  
10 these exposures actually impact our brain  
11 architecture and the metabolites in our brain and  
12 how our brains work.

13 But the in utero period and during infancy  
14 and childhood is a period of rapid growth and  
15 development. And therefore, it can have a bigger  
16 role in terms of shaping brain and behavior.

17 Q. Just to wrap up this question on time  
18 period. So it's true that it's typical for babies  
19 in the U.S. to be exposed to arsenic and lead for  
20 a full year, the nine months of gestation plus  
21 approximately three months postnatally, to lead  
22 and arsenic before they ever encounter baby food.  
23 Correct?

24 A. Lead and arsenic are exposures that are  
25 really lifelong. It's starting with gestation.

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1 What's typical is that babies are exposed in utero  
2 to lead and arsenic and other heavy metals and  
3 throughout all of life.

4 Q. Let's go back and finish up with  
5 Exhibit 8, the testimony about the flame  
6 retardants.

7 A. Okay.

8 Q. And I'm going back to that same third  
9 paragraph on the first page.

10 You say, "Brominated flame retardants are  
11 most notorious for their associations with  
12 impaired development and neurotoxicity." Correct?

13 A. Yup. That's what I see here.

14 Q. And is that a true fact?

15 A. It's been eight years that the -- that  
16 sentence might not be as true anymore. They could  
17 be more notorious at this point -- in the past  
18 eight years, the research on cardiac toxicity  
19 could have ballooned.

20 And maybe I would have written the  
21 sentence that way. It sounds like in 2017, it  
22 sounds like the most amount of research was, on  
23 brominated flame retardants was in relation to  
24 impaired development and neurotoxicity.

25 Q. And are you aware of any research on

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1 brominated flame retardants and neurotoxicity  
2 since 2017 that would change the statement you  
3 made to the Rhode Island Senate back then?

4 A. Like whether since then we have found that  
5 they're actually not associated with impaired  
6 development and neurotoxicity?

7 Q. Correct.

8 A. I have not seen anything to refute that  
9 sentence since then, but it could be. I have not  
10 followed that literature as intently as I did when  
11 I was asked to do all the necessary research for  
12 this.

13 Q. And the last sentence there, "Children who  
14 are more exposed in the womb and in infancy are  
15 more likely to be born preterm, with low birth  
16 weight, with suboptimal neonatal health, lower IQ,  
17 and exhibit impairments in cognition, motor  
18 skills, and behavior, including attention,  
19 impulsivity and anxiety."

20 Did I read that correctly?

21 A. Yes.

22 Q. And is that true?

23 A. Because it's a transcript, it sounds like  
24 it just came out of nowhere without references.

25 But I think I did provide for this a

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1 reference list. I think I had a written copy with  
2 references.

3 But you know, I haven't followed this  
4 literature as intently to see how that literature  
5 has maybe strengthened since 2017 or more things  
6 to add.

7 Q. Brominated flame retardants, the PFAS we  
8 talked about earlier, the phthalates, the  
9 endocrine disrupters that we talked about earlier,  
10 all those things are ubiquitous. They're all  
11 around us every day. Correct?

12 A. Those are all endocrine disrupting  
13 chemicals. And they're all decreasing, like,  
14 substantially.

15 So the amount of regulations in terms of  
16 brominated flame retardants since 2017 is just --  
17 I mean, this was written at a time when, like, all  
18 couches had brominated flame retardants.

19 It was like, you know, 2025 was my dream  
20 at this time where it's pretty much impossible to  
21 find a couch with brominated flame -- I don't even  
22 know if anyone makes couches with brominated flame  
23 retardants.

24 I was talking about brominated flame  
25 retardants and baby products. People aren't



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1 adding brominated flame retardants to baby  
2 products anymore. Not at all.

3 The amounts of exposure, at least in new  
4 products, since 2017 has just plummeted. The  
5 exposures to certain PFAS have plummeted based on  
6 regulations.

7 Some PFAS are not as regulated. Their  
8 exposures have stayed steady. Some have actually  
9 increased. But like the two that had regulation,  
10 PFOA, PFOS, they've plummeted but they still  
11 remain prevalent because a lot of people have  
12 older items in their home.

13 So it's not like the exposure is nothing,  
14 that just because these things are regulated it's  
15 nothing.

16 Just like heavy metals in baby food. Now  
17 there's regulation, so the exposures are going to  
18 decrease a lot.

19 That's the beauty of regulations is that  
20 it protects us. Maybe not enough, but it does  
21 protect us.

22 But still, I mean, there's no definition  
23 of what the term "ubiquitous" is. But are  
24 children still exposed to brominated flame  
25 retardants? To varying degrees. Some kids, you

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1 know, their homes, their mattresses, their  
2 furniture, their electronics were all old and so  
3 there's a lot of dust from brominated flame  
4 retardants in their homes. So it's all of varying  
5 degree, just like with lead and arsenic.

6 Children are exposed, babies are exposed  
7 to varying amounts of lead and arsenic.

8 Q. Are you aware that people have raised the  
9 issue whether exposure to brominated flame  
10 retardants in the home are a cause of autism or  
11 ADHD?

12 A. So I am not prepared to opine here about  
13 that research like I can about lead and cadmium.

14 Trusting that your transcript was correct,  
15 it does suggest that as of March 7th, 2017, there  
16 was data to suggest that brominated flame  
17 retardants was associated with many aspects of  
18 neonatal health, including cognition, motor  
19 skills, behavior, including attention,  
20 impulsivity, and anxiety.

21 So those are all -- these are all topics  
22 that I talk about in my report.

23 But the fact of the matter is, whether --  
24 the degree to which brominated flame retardants  
25 play a causal role in autism and ADHD do not

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1 detract from nor do they confirm my conclusions  
2 that lead and arsenic are causally associated with  
3 autism and ADHD.

4 If I did a thorough report on brominated  
5 flame retardants in relation to autism and ADHD  
6 and I found that, you know what, if a lawyer  
7 called me today and said, you know, I want to  
8 do -- I want to have a lawsuit about brominated  
9 flame retardants in relation to autism and ADHD,  
10 and I might find there's some evidence, but  
11 there's not enough for me to say that, you know,  
12 confidently under oath my conclusion from a  
13 scientific perspective is that brominated flame  
14 retardants are causally associated with autism and  
15 ADHD.

16 And no lawyer has ever called me and asked  
17 me that. But if they did, I would go through a  
18 rigorous process. But that would not mean that  
19 this report on lead and arsenic would either be  
20 more valid or less valid because brominated flame  
21 retardants can be causally associated with ASD and  
22 ADHD even while lead and arsenic are too.

23 Or we could find that they're not causally  
24 associated. That doesn't mean that lead and  
25 arsenic can't be. They're distinct compounds.

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1 MR. KLATT: Object to the responsiveness  
2 of the answer. After everything "I'm not prepared  
3 to opine here about that research," I move to  
4 strike it.

5 Q. Do you remember what my question was?

6 A. Do you want to read it again?

7 Q. Sure. Are you aware that people have  
8 raised the issue whether exposure to brominated  
9 flame retardants in the home are a cause of autism  
10 or ADHD?

11 A. So I haven't reviewed that literature very  
12 carefully. This sentence implies that there is --  
13 that there is sort of speculation about that.

14 I mean, we're talking about attention,  
15 impulsivity. Those are hallmarks of ADHD.

16 Q. Okay.

17 A. But at the same time, the fact that I  
18 didn't include autism and ADHD here suggests that  
19 maybe that research wasn't there in 2017.

20 Q. Do you think -- as a scientist involved in  
21 issues of environmental causes of neurologic  
22 diseases, do you think it's worthwhile for the  
23 potential of brominated flame retardants to cause  
24 autism or ADHD is worth scientific study?

25 A. I mean, I think -- so I think what your



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1 question is -- as someone who reviews NIH grants,  
2 you know, if I saw an NIH grant where someone was  
3 looking at this association, whether I would think  
4 that it was of high merit would partly depend on  
5 the scientific rigor of it.

6 I mean, I think we need to better  
7 understand -- I still think we need to better  
8 understand the health effects of all types of  
9 brominated flame retardants even though their  
10 exposure sources are decreasing.

11 Some people might say we're regulating it  
12 so much and it's decreasing, it's less relevant.  
13 We already know that -- we know that they're  
14 harmful.

15 Just because we know that compounds are  
16 harmful does not mean that we don't want to still  
17 understand all of their causes. We know that lead  
18 and arsenic are so, so, so toxic.

19 But that doesn't mean that, oh, once we've  
20 decided that then we don't keep continuing to  
21 research that. Just because we know that PFAS are  
22 so harmful doesn't mean that we don't want to  
23 better understand whether they also cause  
24 dementia. Just because we know they cause certain  
25 cancers and have immune consequences doesn't mean

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1 we don't also need to understand whether they  
2 cause dementia or not.

3 Q. Do you remember my question?

4 A. Yeah.

5 Q. Do you remember I asked you if it's  
6 worthwhile for the potential cause of --  
7 brominated flame retardants with relationship to  
8 ADHD or ASD is worth studying?

9 A. Yeah. That was my answer to that  
10 question.

11 Q. I didn't ask you anything about lead or  
12 arsenic or even PFAS. I was specifically focusing  
13 on brominated flame retardants.

14 You would agree with me it's worth  
15 scientific study to see whether those ubiquitous  
16 chemicals can potentially cause or contribute to  
17 autism and ADHD. Correct?

18 A. I guess I wasn't -- I didn't come prepared  
19 to opine on what people should or should not  
20 research, what different funding agencies should  
21 or should not fund.

22 I don't have personal plans to study this.  
23 But if someone came to me and said, you know, I'm  
24 going to conduct a big study on brominated flame  
25 retardants and ASD, I won't be like, Don't do

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1 that, we don't need that.

2 But at the same time, I haven't kept up  
3 with that research to say where are the gaps?  
4 Where are the gaps? Where should you focus? What  
5 should you do?

6 Q. And if somebody came to you with a  
7 scientifically appropriate grant proposal to study  
8 the effects of PFAS as a potential cause of autism  
9 and ADHD or ASD and ADHD, you'd think that's  
10 worthy of study as well. Correct?

11 A. It would depend on the study. I'd have to  
12 look at it. I'd have to -- I'm not about to --  
13 I'm not inclined to shoot down anyone's idea of  
14 what to study.

15 And when I review grants for NIH, which  
16 they ask me to do, it's not my role to say what  
17 doesn't deserve to be studied. I have no plans to  
18 study that, if that's what you're asking me about.

19 Q. No.

20 A. Nobody has asked me to study that. And I  
21 would need to review that literature really  
22 carefully in order to identify what are the gaps,  
23 what gaps do we need to fill, like I did in terms  
24 of PFAS and dementia, for example.

25 Q. My question is very simple.

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1 As someone whose work has centered around  
2 environmental causes of neurologic diseases, do  
3 you think the subject of PFAS's potential  
4 causative relationship to ASD or ADHD is worth  
5 scientific study?

6 A. I think studying all environmental risk  
7 factors for ASD and ADHD are important. That's  
8 why I'm here today talking about the fact that  
9 lead and arsenic are causally associated with ASD  
10 and ADHD.

11 I mean, if I didn't think that advocating  
12 and understanding these associations were  
13 important, I wouldn't be here.

14 Q. What other environmental causes, in your  
15 opinion, apart from the heavy metals lead and  
16 arsenic, are potential causes of ASD and ADHD?

17 MR. ESFANDIARY: Objection, beyond the  
18 scope.

19 A. So I'm here prepared under oath to talk  
20 about lead and arsenic and ASD and ADHD. I have  
21 written about -- I have a book chapter. I've  
22 written about some other environmental risk  
23 factors for ASD.

24 But I am not here to opine, I haven't  
25 rigorously written about those ones like I have

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1 for lead and arsenic.

2 So I would say I'm not here to -- I'm not  
3 prepared to really opine about the literature of  
4 the other risk factors.

5 Q. And what were the other risk factors for  
6 ASD that you've previously written about?

7 A. So I wrote about prenatal complications,  
8 prenatal, perinatal, and neonatal complications.

9 Q. Such as?

10 A. Cesarean birth.

11 Q. Is that a risk factor for ASD and ADHD?

12 A. I don't recall exactly the -- what I said  
13 about it. I'd have to look. And it was a while  
14 ago.

15 The literature, I did a meta-analysis.  
16 The effect estimates may have changed, the  
17 literature could have evolved. I'm not here to  
18 speak confidently about the entire up-to-date  
19 literature on those other risk factors for ASD and  
20 ADHD.

21 Q. And you're talking about other  
22 environmental risk factors for ADHD and ASD?

23 A. I think that's what you just asked me  
24 about.

25 Q. Okay. I just wanted to make sure that's

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1 what we were talking about. Correct?

2 A. That's what we're talking about today.  
3 Yeah.

4 Q. Is it your opinion, Dr. Gardener, that  
5 baby food with any level of lead or arsenic is  
6 capable of causing ASD or ADHD in some children?

7 A. So as long as the baby food has lead or  
8 arsenic, it will contribute or can contribute to  
9 the body burden of the lead and arsenic to babies  
10 who consume it.

11 And what we have seen is that there is no  
12 safe level of lead. There's no threshold below  
13 which we can confidently say that those levels --  
14 on a population-wide basis, that exposure level to  
15 lead or arsenic is irrelevant.

16 But whether it causes or contributes to  
17 the ASD or ADHD for any individual child, that's  
18 beyond my scope and that really more relates to  
19 the individual circumstances of that child.

20 How much of that baby food was consumed,  
21 when, what are the specific circumstances, the  
22 health history and, like, all the factors that go  
23 into that child's ability to metabolize and  
24 detoxify those metals and that whole health  
25 history, that relates to specific causation, which

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1 is beyond my scope.

2 Q. But assume with me that you had one jar  
3 of, say, peaches that had an average amount of  
4 lead in it. Let's say 5 parts per billion. Is it  
5 your testimony that that one jar of peaches,  
6 5 parts per billion of lead, is capable of causing  
7 autism or ADHD -- ASD or ADHD, in some population  
8 of children?

9 MR. ESFANDIARY: Objection, incomplete  
10 hypothetical.

11 A. First, it needs to be consumed. Just  
12 sitting on the shelf --

13 Q. Of course.

14 A. So first of all, it needs to be consumed.  
15 And you need to know how much of it is consumed,  
16 when is it consumed, by whom is it consumed.

17 On a population-wide level, if that baby  
18 food is consumed, it's going to impact the body  
19 burden of lead and arsenic in the babies or  
20 children who consume it. The more they consume  
21 it, the more their exposure, the more it will  
22 contribute to their body burden.

23 And what we know is that in the literature  
24 there is a no safe level of these highly toxic  
25 contaminants that has been established.

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1 And what the literature shows is that a  
2 higher exposure increases risk. But the degree of  
3 risk will depend on, you know, for example, how  
4 much is consumed. And whether it's etiologically  
5 relevant for a specific child will depend on that  
6 specific child's determinants.

7 For me, I could have eaten -- my children,  
8 they could have eaten that jar of baby food all  
9 day every day and they might not have gotten  
10 autism. Children vary in terms of their  
11 proclivity and their vulnerability to these  
12 environmental toxins.

13 We know that smoking causes lung cancer,  
14 but there are plenty of people that smoke all day  
15 every day for their entire lives and never get  
16 lung cancer. Because just like the case here,  
17 people vary in terms of their susceptibility to  
18 get an outcome that's associated with the  
19 exposure.

20 Q. Is smoking one cigarette sufficient to  
21 cause lung cancer?

22 A. It depends on the person. I mean, what we  
23 know is that smoking causes DNA damage. The more  
24 you smoke, the higher your risk. So there are  
25 people out there who smoking one cigarette may be

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1 causally associated with their lung cancer. Other  
2 people smoke all day every day, never get lung  
3 cancer.

4 People vary in terms of their proclivity.  
5 And we know that no amount of smoking -- you're  
6 not supposed to smoke any cigarettes.

7 There's no amount of lead that's safe.  
8 There's no amount of arsenic that's safe.

9 Q. So there are some children out there that  
10 could consume a single jar or a single pouch of  
11 baby food that has lead in it and that could cause  
12 their autism or ADHD. Correct?

13 MR. ESFANDIARY: Objection.

14 Q. Just like you said with one cigarette  
15 causing lung cancer.

16 MR. ESFANDIARY: Incomplete hypothetical.

17 A. It depends on that child and their  
18 circumstances. That's really an issue of specific  
19 causation.

20 Q. But I'm asking -- I realize there can be  
21 one child somewhere that is uniquely sensitive to  
22 something. But I'm talking about on a population  
23 level where we're talking about literally millions  
24 of kids eating baby food.

25 Do you think that there are some children

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1 within that population that would develop autism,  
2 ASD, or ADHD from consuming one jar or one pouch  
3 of baby food that has some content of lead in it?  
4 5 parts per billion?

5 A. You just answered your question. You just  
6 said at the beginning of your question, you said  
7 "I know that there's some child out there."

8 So I'm going to agree with, you know, what  
9 you said. You said you know -- yes. Children  
10 differ in their susceptibility. And baby food  
11 needs to be safe for the population.

12 There are many kids out there who would  
13 appear fine even if their house paint is filled  
14 with lead.

15 I grew up in a house where the paint was  
16 filled with lead. I made it to Harvard, graduated  
17 with almost perfect grades. Made it to Dartmouth,  
18 graduated with almost perfect grades.

19 That does not mean that the amount of lead  
20 that was really high in the house paint in the  
21 house that I grew up in was safe. That doesn't  
22 mean that paint companies should be like, we don't  
23 need to take the lead out of house paint. Look at  
24 Hannah. Look how great she did. Look at how  
25 great she's doing at this deposition today even

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1 with all the lead that she was exposed to. That's  
2 not how it works. It probably also gave me a  
3 little anxiety today too. But whatever.

4 We need to make these products safe for  
5 the population in general. We took lead out of  
6 house paint because it was dangerous for the  
7 population, because there were so many other  
8 people that could not have -- that had more  
9 vulnerability that I had for whatever reason to  
10 that -- the lead in that house paint.

11 And the same needs to be true for other  
12 exposures too. Just because plenty of kids ate  
13 tons of baby food and do not end up autistic does  
14 not mean that lead in baby food does not cause  
15 autism.

16 Q. Are you offering an opinion in this case  
17 on the dose of lead or arsenic that increases the  
18 risk in some children?

19 A. So my opinions are all laid out here. My  
20 opinions, I agree with the scientific consensus  
21 from so many organizations. The American Academy  
22 of Pediatrics, the CDC, the FDA, the WHO, every  
23 major scientific body has said there's no safe  
24 level of lead. And I agree with that.

25 Maybe one day we will find that there's

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1 exposure that -- there's tiny, tiny exposures that  
2 people really today are not exposed to that  
3 actually are not deleterious. But based on the  
4 current environmental landscape and all of the  
5 scientific literature, there is no safe level of  
6 lead.

7 There's no level that we see in the  
8 literature where we can confidently say that  
9 exposure is safe from an autism perspective. We  
10 see that the higher the dose, the increased risk  
11 of ADHD and ASD.

12 My charge was not to give a dose that was  
13 safe. I would not have been able to do so.

14 My charge related to whether the exposure  
15 sources from baby food in these hypothetical menus  
16 and from what I know about heavy metals in baby  
17 food, whether that's meaningful, whether --  
18 because if it was not meaningful, then this would  
19 not be meaningful.

20 This was a part of my charge and my task  
21 that was really added this time around to say,  
22 like, is this a relevant exposure source.

23 And we do know it is a relevant exposure  
24 source. For a large portion of kids, food is  
25 their primary exposure source.

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1 MR. KLATT: Okay. Why don't we take a  
2 break.  
3 THE VIDEOGRAPHER: This concludes Media  
4 Number 5. Going off the record, 2:47 p.m.  
5 (Recess, 2:47 p.m. to 3:04 p.m.)  
6 (Exhibit 9 marked for identification)  
7 THE VIDEOGRAPHER: This is the beginning  
8 of Media Number 6. Going back on the record,  
9 3:04 p.m.  
10 BY MR. KLATT:  
11 Q. Dr. Gardener, I think you joked earlier  
12 about how the deposition was stressful for you.  
13 Does that in any way interfere with your ability  
14 to give full, complete, and truthful answers to my  
15 questions today?  
16 A. I don't think so.  
17 Q. Okay. I'll show you what is marked as  
18 Exhibit 9. I alluded to it earlier. It's from  
19 the EPA website on biomonitoring for lead. Do you  
20 see Exhibit 9 there?  
21 A. I do.  
22 Q. I'm just looking at the very first  
23 paragraph. It says, "Lead is a naturally  
24 occurring metal used in production of fuels,  
25 paints, ceramic products, batteries, solder, and a

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1 variety of consumer products. The use of leaded  
2 gasoline in lead-based paint was eliminated or  
3 restricted in the United States. However,  
4 children continue to be exposed to lead due to the  
5 widespread distribution of lead in the  
6 environment."  
7 Do you see that?  
8 A. I do.  
9 Q. And I think earlier I had indicated the  
10 EPA said something about exposure to house dust.  
11 So if you would turn -- probably the  
12 easiest way to do this is to go from the back,  
13 four pages from the back. It looks like this. It  
14 says, "About the lead indicators."  
15 A. Yup.  
16 Q. Do you see that page?  
17 A. I do.  
18 Q. And I'm looking at the second paragraph  
19 under "About the lead indicators."  
20 And it said -- EPA says, "Lead is a  
21 naturally occurring metal used in the production  
22 of fuels, paints, ceramic products, batteries,  
23 solder, and a variety of consumer products."  
24 Do you have any reason to disagree with  
25 that?

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1 A. I mean, it's a little weird to say it's  
2 naturally occurring in batteries since batteries  
3 aren't really natural materials. But it is what  
4 it is. Yeah. The sentence is --  
5 Q. Lead is an element. Correct?  
6 A. That's true.  
7 Q. In that sense, it's naturally occurring.  
8 Correct?  
9 A. Okay. I mean, I think it's weird to say  
10 that in this synthetic product something is  
11 natural.  
12 Q. I don't want to get into a debate with  
13 you. It says it's a naturally occurring metal,  
14 which it is, used in the production of these  
15 things. Correct?  
16 A. Uh-hmm. Yes. Correct.  
17 Q. And you would agree with that?  
18 A. Yes.  
19 Q. It is --  
20 A. Yes.  
21 Q. And then it says, "The use of leaded  
22 gasoline and lead-based paint was eliminated or  
23 restricted in the United States beginning in the  
24 1970s, resulting in substantial reductions in  
25 exposure to lead." Correct?

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1 A. Correct.  
2 Q. And is that consistent with your  
3 understanding as well?  
4 A. Yes.  
5 Q. Meaning all of us who were born before the  
6 1970s were exposed to massive amounts of lead.  
7 Correct?  
8 A. Well, people varied in how much they were  
9 exposed to in the past. And currently, there are  
10 people today who are exposed to more than people  
11 who were born in 1950. But as a population, the  
12 lead levels have decreased.  
13 Q. Do you have any idea how much the blood  
14 lead levels on average in children have decreased  
15 in the United States from the 1970s to the 2020s?  
16 A. The amount -- like, the population  
17 averages, I don't know, off the top of my head.  
18 It's been substantial.  
19 Q. The next sentence says, "However, children  
20 continue to be exposed to lead due to the  
21 widespread distribution of lead in the  
22 environment." Do you see that?  
23 A. I do.  
24 Q. And I think you've talked about that  
25 earlier. Correct?

|  |   |
|--|---|
| <p style="text-align: right;">Page 213</p> <p>1 A. Correct.</p> <p>2 Q. Currently in the United States the major</p> <p>3 source of early childhood lead exposure is</p> <p>4 lead-contaminated house dust. Do you see that?</p> <p>5 A. I do see that.</p> <p>6 Q. And a major contributor to lead in house</p> <p>7 dust is deteriorated or disrupted lead-based</p> <p>8 paint. Do you see that?</p> <p>9 A. I do.</p> <p>10 Q. Do you have any reason to disagree with</p> <p>11 the EPA that currently in the United States a</p> <p>12 major source of early childhood lead exposure is</p> <p>13 lead-contaminated house dust?</p> <p>14 A. I would definitely say that a major source</p> <p>15 is lead-contaminated house dust.</p> <p>16 But, as I talked about in my report, there</p> <p>17 have been many recent studies that have shown that</p> <p>18 for the majority of children who are at the lower</p> <p>19 end of the spectrum of lead that food is the</p> <p>20 biggest contributor to their body lead burden.</p> <p>21 Q. Do you know what studies you're referring</p> <p>22 to?</p> <p>23 A. I can pull up an example. I'm looking.</p> <p>24 So here is one example. The Zartarian,</p> <p>25 et al., paper from 2017.</p>  | <p style="text-align: right;">Page 214</p> <p>1 Q. What page of your report are you referring</p> <p>2 to?</p> <p>3 A. Page 85.</p> <p>4 Q. Okay. Go ahead.</p> <p>5 A. So the majority of children age 1 to 6,</p> <p>6 food is the primary contributor to blood lead</p> <p>7 levels.</p> <p>8 Q. I'm sorry. Where are you reading?</p> <p>9 A. The first sentence under 2, under "Lead."</p> <p>10 "Likewise, the consumption of food has</p> <p>11 long been recognized to be a relevant exposure</p> <p>12 source for lead. And for the majority of children</p> <p>13 age 1 to 6, food is the primary contributor to</p> <p>14 blood lead levels."</p> <p>15 And the citation for this was Zartarian,</p> <p>16 et al., 2017.</p> <p>17 Q. Is it true that homemade baby food is a</p> <p>18 source of lead and arsenic exposure?</p> <p>19 A. Sorry. We're switching gears suddenly. I</p> <p>20 was just like -- I was expecting . . .</p> <p>21 Q. You're talking about food exposure?</p> <p>22 A. Yeah.</p> <p>23 Q. I'm wondering, that can be any foods,</p> <p>24 whether it's commercial baby food, whether it's</p> <p>25 store-bought food, homemade baby food. In your</p>  |
| <p style="text-align: right;">Page 215</p> <p>1 opinion, it can all be a source of lead or arsenic</p> <p>2 exposure. Correct?</p> <p>3 A. Homemade baby food can also be an exposure</p> <p>4 source for lead and arsenic.</p> <p>5 I don't recall them breaking this up in</p> <p>6 the Zartarian 2017 paper. But if you have it, we</p> <p>7 can take a look. But what they talked about --</p> <p>8 and there are other references to -- this was the</p> <p>9 easiest one for me to find -- for the majority of</p> <p>10 young children food is the primary contributor to</p> <p>11 blood lead levels.</p> <p>12 Q. Is it -- let me ask you this.</p> <p>13 In your report, did you review, evaluate,</p> <p>14 and consider longitudinal studies of the total</p> <p>15 diet of early childhood, not specific nutrients</p> <p>16 but the entire diet and diet quality and how it</p> <p>17 relates to subsequent neurocognitive outcomes?</p> <p>18 Are you aware of any studies like that?</p> <p>19 A. So you're talking about did I include</p> <p>20 studies in this report about sort of food diet</p> <p>21 behaviors in relation to neurocognitive outcomes?</p> <p>22 I don't recall any citations to that in</p> <p>23 this report. It was more in relation to diet as</p> <p>24 it relates to or as it interacts with heavy</p> <p>25 metals.</p> | <p style="text-align: right;">Page 216</p> <p>1 Q. But I'm just asking whether you saw any</p> <p>2 studies in your review or considered any studies</p> <p>3 longitudinally that looked at what were the diets</p> <p>4 of children, say, at six months, twelve months,</p> <p>5 and then looked subsequently a few years later to</p> <p>6 see whether the quality of the diet related to</p> <p>7 their neurocognitive outcomes for better or worse?</p> <p>8 A. So irrespective of heavy metals, what's</p> <p>9 the association --</p> <p>10 Q. Correct.</p> <p>11 A. -- between dietary patterns and</p> <p>12 neurocognitive outcomes, you said?</p> <p>13 Q. Exactly right.</p> <p>14 A. I'm not prepared to offer an opinion on</p> <p>15 that.</p> <p>16 Q. Did you review any studies about that in</p> <p>17 preparation for your opinions in the case?</p> <p>18 A. In relation -- did it impact my opinions</p> <p>19 in this case? No.</p> <p>20 Q. Did you evaluate any studies of that?</p> <p>21 A. So there were some studies that did look</p> <p>22 at diet and diet patterns. But for this, I</p> <p>23 related it more to as it could interact with heavy</p> <p>24 metals.</p> <p>25 Q. Did you see in these studies that you</p> |



|   |   |
|---|---|
| <p style="text-align: right;">Page 217</p> <p>1 considered, did you cite any in your report?</p> <p>2 A. Yes. So I talked about -- the report is</p> <p>3 so long now.</p> <p>4 So for example, if you go to page 100.</p> <p>5 Q. Go ahead.</p> <p>6 A. So a few studies have tried to directly</p> <p>7 address the question about whether simultaneous</p> <p>8 dosing of nutrients from food impacts lead -- body</p> <p>9 lead burden. These studies have not addressed the</p> <p>10 interactions between nutrients from food and lead</p> <p>11 and neurodevelopment.</p> <p>12 This is Kordas, et al., 2018. And they</p> <p>13 conducted a cross-sectional study of children age</p> <p>14 5 to 8 in Uruguay that included two 24-hour</p> <p>15 recalls, and they looked at the associations</p> <p>16 between consumption of several nutrients and foods</p> <p>17 with blood and urine lead concentrations.</p> <p>18 They found that dietary intake of iron,</p> <p>19 vitamin C, and zinc were unassociated with lead</p> <p>20 biomarkers.</p> <p>21 In addition to these findings for iron,</p> <p>22 vitamin C, and zinc, the results also showed no</p> <p>23 associations for the consumption of iron-rich</p> <p>24 foods or vitamin C-rich foods.</p> <p>25 Calcium and milk or dairy intake were</p>  | <p style="text-align: right;">Page 218</p> <p>1 associated with lower urine lead levels with</p> <p>2 statistical significance and lower blood lead</p> <p>3 levels without statistical significance.</p> <p>4 And the results showed the intake of</p> <p>5 calcium explained most of the association from</p> <p>6 milk and dairy with urine lead concentrations, as</p> <p>7 the associations for milk and dairy became</p> <p>8 nonsignificant when dietary calcium was included</p> <p>9 in the models.</p> <p>10 These findings lead the authors to</p> <p>11 conclude that in contrast to individual nutrients,</p> <p>12 some of which had been found to impair the</p> <p>13 intestinal absorption of lead, little evidence is</p> <p>14 available in which foods, food groups, or dietary</p> <p>15 patterns could effectively prevent lead exposure</p> <p>16 or lower children's blood lead levels.</p> <p>17 Despite the fact that this study was</p> <p>18 cross-sectional and contradictory, most of the</p> <p>19 supplementation trials on calcium were still</p> <p>20 informative and contributed to my opinions.</p> <p>21 Q. I see that you didn't quote from Kordas</p> <p>22 their statement that aside from the question of</p> <p>23 whether extrapolations can be made to children,</p> <p>24 these studies clearly indicate that studying</p> <p>25 single nutrients does not approximate food dietary</p> |
| <p style="text-align: right;">Page 219</p> <p>1 consumption and its effect on lead absorption.</p> <p>2 So did you evaluate any studies that</p> <p>3 considered food and dietary consumption as a whole</p> <p>4 in outcome as opposed to focusing on specific</p> <p>5 nutrients?</p> <p>6 A. Yes. This study did -- this study did</p> <p>7 both. It looked at food and nutrients.</p> <p>8 It would be assumed that any contribution</p> <p>9 to the foods would be through these nutrients,</p> <p>10 which have been hypothesized at least on a</p> <p>11 cellular level to compete with each other.</p> <p>12 But the question would be even if these --</p> <p>13 on a cellular level these nutrients compete with</p> <p>14 each other, the question would still remain.</p> <p>15 If we did find that, which as I laid out</p> <p>16 in this report we really don't have strong</p> <p>17 evidence for, the question would be, all right,</p> <p>18 when it's diluted in a food, does that matter?</p> <p>19 Like, the calcium question I think is</p> <p>20 really relevant because there's so many warnings</p> <p>21 about lead contamination in calcium supplements.</p> <p>22 If calcium was the answer to lead, we</p> <p>23 wouldn't be getting warnings about lead</p> <p>24 contamination in calcium supplements themselves.</p> <p>25 In fact, that's one of the big sort of lead</p> | <p style="text-align: right;">Page 220</p> <p>1 warnings out there.</p> <p>2 Q. Do you recall that Kordas also said</p> <p>3 opinions may vary, but it seems prudent to adhere</p> <p>4 to current recommendations with the understanding</p> <p>5 that they represent a benefit for children's</p> <p>6 nutritional status.</p> <p>7 The guidelines on iron-rich foods or iron</p> <p>8 supplements to correct existing iron deficiency in</p> <p>9 children exposed to lead, especially in children 2</p> <p>10 to 3 years old or younger who are growing rapidly</p> <p>11 and have high physiological demands for iron, may</p> <p>12 be particularly important.</p> <p>13 MR. ESFANDIARY: And just for the record,</p> <p>14 Counsel is reading from a study by Kordas that he</p> <p>15 has not marked as an exhibit and is not in front</p> <p>16 of Dr. Gardener.</p> <p>17 MR. KLATT: I'm happy to mark it as an</p> <p>18 exhibit.</p> <p>19 A. So your question was do I recall sentences</p> <p>20 in a paper? No, I do not recall the sentences.</p> <p>21 Q. That you quoted in your report.</p> <p>22 A. I don't recall sentences in any of the</p> <p>23 papers that I have included in my report,</p> <p>24 including my own papers. So any paper, I would</p> <p>25 need to --</p>  |



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1 Q. I'll show you that in just a minute.  
 2 Before I get to that, let me ask you this:  
 3 When evaluating potential heavy metal exposures,  
 4 the heavy metal exposures studies that you relied  
 5 on involving postnatal heavy metal levels, to what  
 6 extent did you also consider as part of your  
 7 methodology prenatal heavy metal exposure that  
 8 we've established will occur in almost every  
 9 child?  
 10 A. For example, on page 22 I wrote, "For the  
 11 same reason, I included in my literature reviews  
 12 studies on prenatal exposure to heavy metals. The  
 13 prenatal period represented a different  
 14 etiological period from the one in question in  
 15 this legal matter. However, I found this  
 16 literature highly informative in this case because  
 17 it also allayed my concerns about temporality and  
 18 reverse causation in addition to helping me  
 19 understand biological plausibility.  
 20 "As an example, in the early autism risk  
 21 longitudinal investigation, increased blood lead  
 22 levels during pregnancy were associated with an  
 23 increased risk of ASD, though there was no  
 24 association for urine lead levels."  
 25 And then in each section --

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1 Q. So --  
 2 MR. ESFANDIARY: Don't interrupt.  
 3 Q. I wanted to ask you about that particular  
 4 study. I'm sorry. Were you finished?  
 5 A. So you had asked me how -- to what extent  
 6 I considered it. And so I figured I'd point out  
 7 the places in my report where I discussed it.  
 8 Q. I know that you cited in your report  
 9 studies of prenatal lead exposure and its  
 10 relationship to the outcomes of ASD or ADHD.  
 11 But how did you take those studies into  
 12 account when considering and citing the postnatal  
 13 studies of lead and arsenic?  
 14 A. So I took them into account because what  
 15 they did is they helped allay my concerns about  
 16 potential for reverse causation. They helped  
 17 inform my questions about temporality.  
 18 Q. Well, if a child is exposed prenatally,  
 19 then obviously if you look at that child  
 20 postnatally for their lead levels, you can't  
 21 distinguish whether that exposure occurred pre- or  
 22 postnatally. Correct?  
 23 MR. ESFANDIARY: Objection, vague and  
 24 ambiguous.  
 25 Q. All right. We've established today that

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1 almost all children are exposed prenatally to lead  
 2 and arsenic.  
 3 You've cited studies in your report that  
 4 prenatal lead in some studies has been associated  
 5 with the outcomes of ASD and ADHD. Correct?  
 6 A. Yeah. I would say that the overall  
 7 literature is not as strong and compelling in  
 8 terms of prenatal. There haven't been as many  
 9 studies relating prenatal exposure to autism and  
 10 ADHD as compared to postnatal. But I still did  
 11 take that into consideration.  
 12 Q. How?  
 13 A. So it's understood that when you're  
 14 thinking about postnatal lead and arsenic in  
 15 relation to autism and ADHD -- I'm sorry; that's  
 16 so distracting, whatever that voice is -- that  
 17 that's not their only time period of exposure.  
 18 The fact that babies and children are  
 19 exposed during other periods of time doesn't  
 20 negate the etiological role of postnatal exposure.  
 21 For example, like in my studies of PFAS,  
 22 we're measuring PFAS in people in middle age and  
 23 older age, knowing that they were exposed when  
 24 they were much younger as well. That doesn't mean  
 25 that there isn't an etiological role for

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1 later-life PFAS exposure.  
 2 So I took this into consideration more  
 3 because I was interested in how that can inform  
 4 questions about temporality.  
 5 Q. But recognizing, as you have, that there  
 6 can be and is prenatal exposure to lead and  
 7 arsenic and some studies have related that to the  
 8 outcome of ASD and ADHD, to what extent did you  
 9 factor that into your consideration of the  
 10 postnatal studies you relied on?  
 11 MR. ESFANDIARY: Asked and answered three  
 12 times.  
 13 You can answer it again.  
 14 A. Like I said, it was relevant to me to  
 15 inform temporality -- they're not perfectly  
 16 correlated. So you could -- everyone may be  
 17 exposed in a study to lead. They may have body  
 18 burden of lead.  
 19 But it's still going to be variable.  
 20 There's variability for prenatal exposures and  
 21 there's variability for postnatal exposures to  
 22 both lead and to arsenic.  
 23 So a finding of an association for  
 24 prenatal lead and arsenic doesn't mean that there  
 25 can't be an impact of postnatal lead and arsenic

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1 on ASD and ADHD, nor does it mean that there  
2 definitely is. It's simply important to consider.  
3 As an epidemiologist, I considered the entire  
4 literature on these metals.

5 Q. I understand you considered the whole  
6 literature. I'd like to understand how you  
7 factored in the prenatal exposures to lead and  
8 arsenic to the postnatal studies you relied on.

9 What methodology did you use to exclude  
10 the prenatal effects that you know occur from the  
11 postnatal studies you relied on? Did you use any  
12 methodology to do that?

13 A. You don't want to exclude that. Like, if  
14 we were excluding a role of prenatal exposure,  
15 that would be weird. If anything, that would just  
16 be weird to exclude it.

17 It's like I feel like you keep asking me  
18 about the need to exclude other exposures in my  
19 assessment of causality. That is not how it  
20 works. It's not required.

21 Just like if you were assessing the role  
22 of cigarette smoking in later adulthood, you  
23 wouldn't want to exclude -- you don't need to  
24 exclude the role of cigarette smoking early on in  
25 life.

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1 to body burden. And like I said, for some kids  
2 they can be the primary contributors.

3 For most kids age 1 to 6, food is the  
4 primary contributor. For a lot of kids, their  
5 exposure to heavy metals from other sources can  
6 actually -- can be even bigger.

7 Q. So I'm just simply asking what methodology  
8 did you use to exclude the fact that the total  
9 effect resulting in the outcome of ASD or ADHD  
10 postnatally may have already occurred prenatally?

11 MR. ESFANDIARY: Objection, vague and  
12 ambiguous.

13 A. You wouldn't exclude that  
14 methodologically. That would not be appropriate.  
15 It's so relevant here. I mean --

16 Q. So the effect may have occurred totally  
17 prenatally before you ever get to the postnatal  
18 point. Correct?

19 A. In a great world where you guys remove the  
20 lead and arsenic from your products or your  
21 clients' products, then -- and from other sources  
22 so that the only exposure is prenatally, then yes,  
23 the entire exposure could theoretically in the  
24 future all be prenatal. That's not how it is.

25 Children are born exposed, but then they

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1 Or maybe sun exposure is probably a better  
2 example. We know that sun exposure during  
3 childhood is the most etiologically relevant in  
4 terms of sunburns. That doesn't exclude the role  
5 of adulthood sun exposure, and you wouldn't want  
6 to exclude that.

7 Q. How methodologically did you exclude from  
8 the postnatal heavy metal ASD/ADHD studies you  
9 rely on that the effect may have already occurred  
10 prenatally? How did you exclude that possibility?

11 A. The exposure did start. So I think what  
12 you're saying is these exposures are cumulative.  
13 And so I think you are acknowledging what I have  
14 talked about here, that these are cumulative  
15 exposures.

16 And the fact that children are typically  
17 already born exposed to heavy metals only  
18 underscores the importance of reducing their  
19 presence, you know, and the fact that, you know,  
20 the amount of heavy metals in baby food is  
21 outrageous.

22 It's getting better. You guys are  
23 decreasing it. But it only underscores the need  
24 to reduce those exposures because they're not the  
25 only exposures. They actually -- they contribute

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1 continue to be exposed to varying degrees.  
2 They're exposed to varying degrees before they're  
3 born and then afterwards.

4 Q. How did you evaluate or weigh the relative  
5 contributions of prenatal exposure to lead and  
6 arsenic in the studies versus postnatal effects?

7 A. You don't need to. That's the point, that  
8 it's the body burden. And it actually doesn't  
9 matter, you know, what it's coming from.

10 So, for example, it doesn't matter if it's  
11 coming from their mothers or from the food that  
12 they eat or the dust in their house.

13 What my charge was was to look at their  
14 body burden. And some may have been, you know,  
15 stored from birth. So that's what the studies  
16 really looked at.

17 They didn't look at where -- what the  
18 exposure was. Were they born with a certain  
19 amount of exposure? Did it come from the dust in  
20 their house, the soil in their yard?

21 Q. So the answer to my question is, you  
22 applied no specific evaluation or weighting of the  
23 source of exposure in the postnatal studies of ASD  
24 and ADHD in lead or arsenic that you relied on.  
25 Correct?

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1 MR. ESFANDIARY: Objection, misstates the  
2 testimony.

3 A. That sentence just doesn't make sense.  
4 I'm sorry.

5 Q. All right. You've acknowledged there  
6 could be exposure to these heavy metals, lead and  
7 arsenic, from many different sources. Correct?

8 A. That is correct. Yeah. For not all  
9 children. So different children will be exposed  
10 from different sources.

11 The majority of young children will be  
12 exposed from their food, but not all children.  
13 Some children, the amount they're exposed to from  
14 their food will pale in comparison to the amount  
15 that they were exposed to from other sources. It  
16 will vary.

17 And then the amount that they are exposed  
18 to. So the amount they're exposed to prenatally,  
19 the amount they're exposed to before they start  
20 eating baby food, the amount that they're exposed  
21 to while they're eating baby food, all those  
22 different time periods. You wouldn't want to  
23 exclude them.

24 When you say methodologically, that sort  
25 of implies that I have conducted original research

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1 on this. And as you can see, there was no  
2 Gardener, et al., in terms of the study -- this  
3 hypothetical study that you're trying to ask about  
4 my methodology for doesn't exist.

5 Q. I'm simply asking, did you as part of your  
6 methodology in arriving at your conclusions assign  
7 any weight to prenatal exposure, postnatal  
8 exposure, before consuming baby food, during  
9 consumption of baby food, after consumption of  
10 baby food? Did you assign any sort of weighting  
11 or evaluation of those various sources? And if  
12 you didn't do it, that's fine. I'm just curious  
13 methodologically whether you did that.

14 A. Absolutely. So this matter relates to  
15 postnatal exposure. So coming to my conclusions,  
16 I really weighted the data from postnatal  
17 exposure.

18 I considered that prenatal exposure too.  
19 But in forming my opinions, what's most relevant  
20 for this matter is postnatal exposure. So that  
21 was --

22 Q. But how did you consider or weigh the  
23 prenatal exposure? I don't understand how you did  
24 that other than just saying you considered it.

25 MR. ESFANDIARY: Objection.

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1 Q. You had to use some methodology or process  
2 to factor in the prenatal exposures in relying on  
3 the postnatal studies. Right?

4 MR. ESFANDIARY: Objection, vague and  
5 ambiguous. The question doesn't make any sense.

6 A. The question doesn't make sense from an  
7 epi perspective. I don't know if there are  
8 specific methodologies that you're asking.

9 Q. Just whether you had one, that's all I'm  
10 asking, to weight the different sources of  
11 exposure in different time periods of exposure.

12 A. I'm sorry. The question just doesn't make  
13 sense.

14 Q. So you didn't apply any such  
15 methodology --

16 MR. ESFANDIARY: No.

17 A. The question doesn't --

18 MR. ESFANDIARY: That misstates the  
19 testimony.

20 Q. How did you weight prenatal exposure with  
21 respect to the postnatal studies you relied on?

22 A. Yeah. So the way that I weighted this  
23 into my opinion is I also read the literature on  
24 the prenatal exposure. And I used it to help  
25 really allay my concerns about potential --

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1 concerns about potential temporality in the  
2 literature on the postnatal exposure.

3 Q. The kids in the postnatal exposure studies  
4 all would have been exposed prenatally. Correct?

5 MR. ESFANDIARY: Objection, calls for  
6 speculation, overbroad.

7 A. So when you say -- it all varies. People  
8 are exposed to varying amounts postnatally and  
9 prenatally.

10 Q. I understand. And did you do any sort of  
11 evaluation or weighting in the studies you  
12 considered to apportion a certain amount to  
13 prenatal lead and arsenic exposure, a certain  
14 amount to postnatal lead or arsenic exposure?

15 A. I'm sorry, but your question just makes no  
16 sense from an epi -- it's just not a question any  
17 epidemiologist or biostatistician would -- it  
18 doesn't make sense to my profession, so I don't  
19 know how to answer it and I don't know how to  
20 describe to you why or how it makes no sense.

21 Q. Did you consider at all quantitatively the  
22 prenatal contribution of exposure to lead and  
23 arsenic in the postnatal studies you relied on?

24 A. I feel like you're trying to ask it in  
25 different ways. It just doesn't make sense. I

1 feel like I have answered this question over and  
 2 over again.  
 3 I think what -- you're asking a question  
 4 that could be a valid question about an individual  
 5 study that I authored.

6 Q. No. I'm asking your --

7 A. I just don't understand your question.

8 Q. I'm sorry. I talked over you.

9 I'm asking you when you evaluated the  
 10 postnatal heavy metal exposure studies that you  
 11 rely on and have described in your report, I'm  
 12 just wondering how you considered or evaluated,  
 13 let's say, contribution of genetics to the  
 14 outcome.

15 How did you evaluate contribution of  
 16 genetics versus what you believe is contribution  
 17 of the heavy metals?

18 A. Yeah. So I can talk about that. Do you  
 19 want me to talk about --

20 Q. I just --

21 A. -- how I thought about genetics?

22 Q. I was just wondering --

23 MR. ESFANDIARY: Whoa, whoa, whoa. She  
 24 was in the middle of answering your question.

25 You asked about genetics. Do you want to

1 withdraw that question and ask a new one?

2 MR. KLATT: I'll withdraw the question.

3 Q. Did you consider the contribution of  
 4 genetics to the outcome of the postnatal heavy  
 5 metal studies that you relied on for your opinions  
 6 in the case?

7 A. Yeah. I talked a lot about genetics here.  
 8 Genetics are relevant. And I talked about how  
 9 there is data to suggest that the interaction  
 10 between the genetics -- genetic factors and lead  
 11 and arsenic, that there is -- so when we talk  
 12 about some kids are more vulnerable, there are  
 13 some kids for whom baby food is going -- heavy  
 14 metals from baby food is going to be more  
 15 etiologically relevant than other kids and how I,  
 16 as an epidemiologist, look at it from a population  
 17 perspective.

18 But from an individual perspective, you  
 19 have to think about the circumstances of that  
 20 child.

21 And part of that is genetics, and there  
 22 are genetic risk factors for autism. We know that  
 23 there's a role for lead and arsenic in causing  
 24 autism and ADHD. And that likely interacts with  
 25 genes and their control of the metabolism,

1 absorption, detoxification of lead and arsenic  
 2 such that an amount of heavy metals would be more  
 3 etiologically relevant, more likely to cause ASD  
 4 and ADHD in those children than in other children.

5 And I talked about that in this report.

6 Q. Did you come to any conclusions on the  
 7 extent to which in the heavy metal studies you  
 8 rely on genetics contributes to the outcome of ASD  
 9 or ADHD compared to the percentage contribution of  
 10 what you believe is heavy metal exposure?

11 A. So I thought you were going somewhere  
 12 different.

13 So how much these genes, these autism  
 14 genes are impacting the causality of lead and  
 15 arsenic. It's presumed to be substantial. That's  
 16 beyond the -- I was not charged with identifying  
 17 that.

18 Q. So you didn't --

19 A. So the amount, that would be irrespective  
 20 of your genes and the amount that wouldn't -- that  
 21 probably partly depends on how exposed you are.

22 So there are some genes that make it so  
 23 that your exposures to certain toxins are more  
 24 relevant.

25 And this is a good analogy in terms of,

1 like, smoking and lung cancer. Part of the reason  
 2 why some people will smoke all day every day and  
 3 never get lung cancer is because their genetics  
 4 are different from the person who just smokes a  
 5 tiny amount and gets lung cancer.

6 There's a difference in their genes that  
 7 regulate how the toxins in cigarettes are  
 8 metabolized and absorbed and how they impact the  
 9 etiology of that disease.

10 That's the exact same thing that's  
 11 hypothesized here. We know that lead and arsenic  
 12 cause autism and ADHD, as I laid this out here.

13 How the specific genes that are involved,  
 14 how that relates, which ones are -- which ones are  
 15 controlling those pathways, that has not been  
 16 worked out. It's been talked about. But we don't  
 17 have specific answers for that.

18 Q. When evaluating the postnatal heavy metal  
 19 exposure studies that you rely on in coming to  
 20 your opinions in the case, how did you consider  
 21 the extent to which other environmental exposures  
 22 other than lead and arsenic may have contributed  
 23 to the outcome of ASD or ADHD?

24 A. That wasn't part of my charge. So that's  
 25 a specific causation. That is for the other

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1 experts who need to think about, all right, you  
2 have a specific child. And what are their  
3 different exposures?

4 For example, an epidemiologist can say,  
5 you know, all right, smoking is a strong risk  
6 factor for lung cancer. Radon is a strong risk  
7 factor for lung cancer. We don't need to know the  
8 amount of radon to -- actually in our equations  
9 for identifying the etiological fraction of  
10 smoking. We actually don't even take into account  
11 radon.

12 That's different from someone who would be  
13 charged with specific people and deciding their --  
14 the impact of smoking versus radon for those  
15 individuals.

16 So when we look at the etiological  
17 fraction, the attributable risk in an epi study,  
18 we don't necessarily need to -- we don't bring in  
19 the other risk factors. When you add them all up,  
20 there can be over 100 percent. But that's very  
21 different from the science of identifying the  
22 etiological role for individuals.

23 Q. So it wasn't part of your charge to  
24 consider the extent to which other environmental  
25 exposures other than lead and arsenic may have

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1 contributed to the outcome of ASD and ADHD in the  
2 studies you rely on. Correct?

3 MR. ESFANDIARY: Objection, misstates the  
4 testimony.

5 MR. KLATT: She said that wasn't part of  
6 my charge.

7 Q. Is that correct?

8 A. Can you show me where I said -- how about  
9 this? I'll read you my charge. Anything that's  
10 not in what I read is not part of my charge.

11 Q. That's not my question.

12 I said, how did you consider the extent to  
13 which other environmental exposures other than  
14 lead and arsenic may have contributed to the  
15 outcome of ASD and ADHD in the studies you relied  
16 on?

17 And your answer was, that wasn't part of  
18 my charge, my specific causation.

19 MR. ESFANDIARY: No, You're misstating the  
20 testimony. You're omitting literally paragraphs  
21 of her answer.

22 MR. KLATT: Nonresponsive paragraphs.

23 MR. ESFANDIARY: Read her entire response.

24 MR. KLATT: No, I'm not going to waste  
25 time doing that. You can ask her that.

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1 MR. ESFANDIARY: No, I don't need to.

2 Q. Is it part of your charge or not to  
3 consider the extent to which other environmental  
4 exposures other than lead and arsenic may have  
5 contributed to the outcome of ASD and ADHD in the  
6 studies that you rely on in this case?

7 A. So that question just doesn't make sense  
8 from an epi perspective. It literally makes no  
9 sense.

10 Q. Was it part of your charge?

11 A. My charge made a lot of sense, and I'm  
12 happy to read it. Things that make absolutely no  
13 sense scientifically were not part of my charge.

14 If a lawyer gave me a charge that made no  
15 sense, I would say, Pedram, that makes no sense.  
16 I'm not talking about that under oath because that  
17 makes no sense.

18 Q. When evaluating the postnatal heavy metal  
19 exposure studies that you rely on in coming to  
20 your opinions in this case, how did you consider  
21 the extent to which other environmental exposures  
22 other than lead and arsenic may have contributed  
23 to the outcome of ASD or ADHD?

24 A. The question doesn't make sense. I don't  
25 know how to explain to you the fact that that

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1 sentence -- that question makes no sense. So I  
2 don't know how to answer it.

3 Q. Did you do it or not?

4 A. I didn't do anything that makes no sense.  
5 I would not. If you called me and tried to --

6 MR. ESFANDIARY: Wait for a question.

7 Q. Did you consider the extent to which other  
8 environmental exposures in the studies you rely on  
9 for ASD and ADHD may have contributed to the  
10 outcome in the studies? Did you consider it or  
11 not?

12 MR. ESFANDIARY: Asked and answered.

13 A. The question -- what is the outcome in the  
14 study?

15 Q. ASD or ADHD.

16 A. That's not -- like, it just makes no  
17 sense. Like, the question just doesn't make  
18 sense.

19 If you came to me and gave me that as a  
20 charge, I would say to you that charge doesn't  
21 make sense.

22 MR. ESFANDIARY: Mike, maybe I can help  
23 out. Are you asking about confounding? Is that  
24 what you're trying to get at in the studies?

25 MR. KLATT: I'm just asking whether she



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1 considered --

2 MR. ESFANDIARY: I know, I know. But  
3 clearly it's not working. So are you asking  
4 whether some of the results were confounded by  
5 other exposures? Maybe you should ask it that  
6 way.

7 MR. KLATT: All right. Let's ask Pedram's  
8 question.

9 Q. Were the results of the postnatal ADHD and  
10 ASD studies regarding lead and arsenic confounded  
11 by other environmental exposures?

12 A. So I did think about what confounders were  
13 controlled for, and I thought about, you know,  
14 what are possible confounders.

15 I think sort of this line of questioning  
16 came on the heels of thinking about, like, PFAS  
17 and brominated flame retardants. Those are not  
18 considered major confounders.

19 I haven't seen those controlled for in the  
20 study. I haven't seen -- in talking to people, in  
21 reviewing other grants on these heavy metals, I've  
22 never heard of people saying, "Oh, but they didn't  
23 adjust for brominated flame retardants or PFAS."

24 Q. Or phthalates?

25 A. Yes, or phthalates. I've never -- in all

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1 the -- I shouldn't say that.

2 In other things that I've been asked to  
3 review, that does not come up as an important  
4 source of bias.

5 Q. Let me ask you --

6 A. And we have literature on --

7 Q. There's no question pending.

8 MR. ESFANDIARY: She was finishing  
9 answering your initial question.

10 A. Am I allowed to take a minute to pause  
11 and, like, think about another --

12 MR. ESFANDIARY: Of course you are.

13 A. So when you think about -- right now  
14 there's all these exposures to PFAS, to  
15 phthalates, to brominated flame retardants.

16 We knew -- we have strong data that lead  
17 and arsenic were important neurotoxins during  
18 times when those exposures were not nearly as  
19 prevalent as they are now.

20 So I am confident that my opinions on --  
21 that lead and arsenic cause autism and ADHD are  
22 not only in the absence of other environmental  
23 toxins.

24 MR. KLATT: Object to the  
25 nonresponsiveness of the answer and move to strike

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1 everything that begins with "when you think  
2 about."

3 Q. Can we go back to I believe it's  
4 Exhibit 3, which is the supplemental report.

5 A. Exhibit 3. This rebuttal?

6 Q. I called it supplemental. You're correct,  
7 Exhibit 3 is your rebuttal report of July 15th,  
8 2025 in this case. Correct? Is that correct?

9 A. That it's Exhibit 3, yes.

10 Q. And in there, you talked about the levels  
11 of heavy metals that were calculated by Dr. Jones.  
12 And if you need to, take a second to look at that.

13 A. Yes.

14 Q. Do you understand how Dr. Jones calculated  
15 her blood lead levels?

16 A. No, I do not have -- I am not well versed  
17 in how she did that.

18 Q. What is your understanding of what  
19 Dr. Jones was trying to calculate there? What  
20 were those blood lead levels representative of?

21 A. Can you show me?

22 Q. Let's look. You said -- in Exhibit 3 you  
23 said, "In my report I discuss how the levels  
24 calculated by Dr. Jones represented meaningful  
25 exposures of lead or arsenic by comparing the

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1 levels to various benchmarks and finding those  
2 benchmarks were exceeded. I've now been advised  
3 that Dr. Jones has revised her estimates of the  
4 average daily dose of lead and arsenic in  
5 defendants' baby food and the blood levels  
6 associated with those doses."

7 Do you see that?

8 A. I sort of lost you, but okay.

9 Q. Go ahead and read if you need to, to catch  
10 up. I was just reading from the rebuttal report.

11 A. Okay.

12 Q. So I'm just trying to understand what  
13 these daily doses in blood levels represent. Is  
14 that what a typical child might consume? What is  
15 your understanding of what those values represent?

16 A. They represented hypothetical menus. I'm  
17 just thinking. Like -- how to describe this?  
18 Like a possible distribution across a day of  
19 various baby foods.

20 Q. The menus that Dr. Jones made calculations  
21 for, these hypothetical menus, did you do any  
22 evaluation to consider whether they were realistic  
23 menus that actually might be consumed by a child  
24 or not?

25 A. No, I didn't. But I also don't really



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1 have the expertise. I don't have the expertise to  
2 come up with menus for a hypothetical child. I've  
3 only fed two children, my own children, in my  
4 whole life. I have never created or analyzed  
5 other people's hypothetical menus, so I don't have  
6 the expertise to say how realistic, how  
7 representative they might be.

8 Q. Okay.

9 A. How many kids have eaten, will eat, would  
10 eat those precise menus.

11 Q. Are you offering an opinion, Dr. Gardener,  
12 on the minimum dose and duration of exposure to  
13 lead that's necessary to cause ASD or ADHD from  
14 any source?

15 MR. ESFANDIARY: Objection, previously  
16 asked and answered.

17 A. So what I've written in my report many  
18 times is that there is no safe level of lead. And  
19 there are many health organizations that have  
20 repeatedly stated that there is no safe level of  
21 lead.

22 And in the literature, there is no level  
23 of lead exposure below which we can say, you know,  
24 autism or ADHD would not be causally related.

25 What we do see in the literature is that

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1 in populations with really, really low levels of  
2 exposure, there's still variability. And within  
3 that variability, we're seeing associations with  
4 lead and ADHD.

5 And so I -- there was no minimum amount of  
6 exposure. There was also a suggestion that within  
7 those levels increased exposure was associated  
8 with an increased risk.

9 So I am not here with an estimate for an  
10 amount of exposure that is safe, nor am I here  
11 saying that there's an amount of an exposure that  
12 would always cause autism or ADHD.

13 Really on a population-wide level,  
14 increased exposure is associated with an increased  
15 risk.

16 But on an individual level, it would  
17 depend on the circumstances of that child, that  
18 child's genetics, that child's -- the amount that  
19 they are exposed, and their ability to detoxify  
20 and metabolize that lead and their exposure from  
21 other sources, their other environmental  
22 exposures.

23 Q. So you're not offering an opinion in this  
24 case on the minimum amount of lead that's  
25 necessary to cause ADHD or ASD. Correct?

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1 A. Right. I don't have . . .  
2 (Interruption)

3 A. There is no amount that is minimally --  
4 there is no minimum amount of exposure or -- below  
5 which autism -- lead and arsenic don't cause  
6 autism and ADHD, nor is there a maximum amount. I  
7 mean, there's an amount a child might die, but  
8 they might die not autistic, without ADHD.

9 Q. Are you offering any opinion in this case  
10 that homemade baby food is safer than commercially  
11 bought baby food?

12 A. That was not part of my charge, and that  
13 was not -- all of my opinions are laid out.

14 Q. As a scientist in this area who's reviewed  
15 literature, you're not intending to offer any  
16 opinion that homemade baby food or table food is  
17 safer than commercially bought baby food.  
18 Correct?

19 A. Safer? Safer is very broad. So I'm not  
20 representing anything about anything being safer  
21 or less safe. I am not rendering any opinions  
22 about the exposure sources.

23 Like I said, what matters is the body  
24 burden. And the amount of lead exposure from a  
25 jarred, you know -- a jarred Plum apple sauce,

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1 versus an apple sauce -- shout it out.

2 I don't even know if Plum makes a jarred  
3 apple sauce versus a batch of apple sauce that I  
4 may have made myself. I'm not saying that either  
5 of those sources are better or worse. They both  
6 can contribute to the overall body burden.

7 Q. And so you believe that fruits,  
8 vegetables, or grains purchased off the shelf, not  
9 as part of a commercially prepared product, are  
10 sufficient to cause ASD or ADHD if they contain  
11 lead or arsenic?

12 MR. ESFANDIARY: Objection, overbroad,  
13 calls for speculation, and undisclosed opinion.

14 A. And so many components to that. If I said  
15 yes or if I said no, it would be like what part of  
16 this could be no.

17 Q. I'm just -- would you like me to rephrase  
18 it or can you answer?

19 MR. ESFANDIARY: If she'd like you to  
20 rephrase it, she'll tell you. But she was  
21 answering the question.

22 Go ahead, Doctor.

23 A. There was so many compounds in there.

24 Q. Let's read it again.

25 Do you believe that fruits, vegetables, or

1 grains purchased off the shelf at a grocery store  
2 in the U.S. that aren't part of commercially  
3 prepared baby food are sufficient to cause ASD or  
4 ADHD if they contain lead or arsenic?

5 MR. ESFANDIARY: That's literally the same  
6 question, so I'm going to state the same  
7 objections: overbroad, calls for speculation,  
8 undisclosed opinion.

9 A. So the "sufficiency" word -- there really  
10 is a specific causation because there's no --  
11 there's no amount that, you know, on a  
12 population-wide level every single person who gets  
13 this grain and this is going to be autistic or  
14 have ADHD.

15 What I'm saying is what you named, grains,  
16 fruits, and vegetables that are not part of  
17 commercial baby food, that you go to Shaw's and  
18 you get some food and you mix it up and you give  
19 it to your baby, that can and may have both lead  
20 and arsenic.

21 And that lead and arsenic will contribute  
22 to the body burden of the children, the babies,  
23 the adults that consume that product -- those  
24 products and can contribute as a result to the  
25 neurodevelopmental harm on a population-wide

1 level.

2 For a specific individual, whether that  
3 specific child will end up with autism or ADHD,  
4 that's a totally different factor.

5 But if you're asking are there relevant  
6 sources of lead and arsenic on a grocery shelf  
7 beyond what's in the baby food aisle, yes.

8 Lead and arsenic are not just problems of  
9 the baby food industry. The baby food industry  
10 seems to be making great strides in terms of  
11 reducing those exposures. My hope is that that  
12 will -- that will be translated to food more  
13 generally.

14 Q. Do you believe that the produce in the  
15 produce section that's not in a jar or pouch but  
16 just available, the fruits and vegetables on the  
17 produce shelf at grocery stores, contain lead or  
18 arsenic?

19 MR. ESFANDIARY: Objection, overbroad,  
20 vague and ambiguous, calls for speaks.

21 A. Some will and some won't. I mean, it  
22 depends on the produce, where it's grown, what  
23 water, what soil.

24 Lead and arsenic are not specific to baby  
25 food. There's plenty of fruits and vegetables.

1 In some circumstances, there can be contamination  
2 related to the processing, but a lot of the  
3 exposure is understood to be from the soil from  
4 which it's grown, the water from which it's grown.

5 So that would relate not just to food in  
6 the baby aisle but outside the baby aisle,  
7 absolutely, as well. And when those items have  
8 lead and arsenic, they're also etiologically  
9 relevant because the source doesn't matter.

10 My charge here related more to the lead  
11 and the arsenic exposure in terms of their ability  
12 to cause autism and ADHD. And that's not specific  
13 to baby food. It relates to homemade food, food  
14 anywhere in the grocery.

15 And it's not just related to food. It's  
16 related to the home environment in general, the  
17 school environment. So many different exposures.  
18 And it's not exclusive of -- it doesn't exclude  
19 the role of food as well.

20 Q. You rely on a number of foreign studies in  
21 your materials considered list and in your report.

22 Do you have any understanding whether on  
23 average on the population level children's  
24 exposures to heavy metals in non-Western  
25 developing countries are often much higher than

1 those in the United States?

2 A. They can be. It depends on the time  
3 period. It depends on the population. The levels  
4 of heavy metals vary within the United States,  
5 over time, by country, by county.

6 Q. For example, in the -- in your materials  
7 considered list, Exhibit 3, I think on page 26 you  
8 refer to several studies by a lead author of  
9 Rahbar or Rahbar, done in Jamaica.

10 A. I'm sorry. Which exhibit are we looking  
11 at?

12 Q. Exhibit 3, your materials considered list.

13 A. Yup.

14 Q. I believe it's at page 26.

15 A. Yup. There were a few studies. So what I  
16 see here is that in the past -- in the past, my  
17 reports have also included mercury. And so, like,  
18 I just noticed this. Some of these articles in  
19 this list may not actually have informed my  
20 opinion on the current version of my report. The  
21 version of my report relates to lead and arsenic.

22 For example, I just saw Reference  
23 Number 394 says, "Seafood consumption and blood  
24 mercury concentrations in Jamaican children."

25 That's an example I just noticed of

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1 something that probably doesn't actually --

2 Q. Is that one of the Rahbar or Rahbar  
3 studies?

4 A. Yes.

5 Q. And there's a couple of other Rahbar  
6 studies you cite there. Correct?

7 A. Yes.

8 Q. Are any of them relating to lead?

9 A. So if I'm just looking at the titles,  
10 there's one that says, "Blood lead concentrations  
11 in Jamaican children with and without autism  
12 spectrum."

13 Q. Are you aware that the mean lead level of  
14 lead in Jamaican soil is two to three times higher  
15 than that in the United States?

16 A. I am not prepared to opine on the relative  
17 levels of lead in soil in the United States versus  
18 Jamaica.

19 Q. What about the studies from Egypt that you  
20 cite in your materials considered? Do you know  
21 any comparison between the average blood lead  
22 levels of Egyptian children compared to the  
23 average blood levels of United States children?

24 A. So blood lead levels will change over time  
25 and by location within the United States, within

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1 Massachusetts, within whatever state you live in,  
2 and by country, by time, and by different  
3 populations, by different race and ethnic groups,  
4 for example.

5 And what matters is not necessarily where  
6 the blood -- where the lead is coming from but the  
7 overall contribution.

8 And even when you look at, like -- say you  
9 were comparing New York versus Massachusetts and  
10 you saw, say, Massachusetts had higher blood lead  
11 levels than kids in New York, there would still be  
12 many kids in Massachusetts who would have much  
13 lower levels of lead and kids in New York who have  
14 much higher levels of lead. It's just that there  
15 might be a difference in the overall distribution.

16 But at any location, you're going to have  
17 variability.

18 Q. In citing Egyptian studies in your report,  
19 are you aware that the average Egyptian child has  
20 blood lead levels up to five to ten times higher  
21 than the average U.S. child?

22 A. I can't confirm or deny that, off the top  
23 of my head. One of the great things about this  
24 literature and one of the strengths is that there  
25 was a confluence of data from many different

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1 populations of kids.

2 So for example, not all of the data came  
3 from the past five years where overall kids had  
4 lower lead levels than ten years ago.

5 That doesn't mean that the data from ten  
6 years ago isn't relevant or the data from 15 years  
7 ago isn't relative. It just impacts the  
8 distribution.

9 And one of -- the beauty of sort of  
10 looking at different time periods and kids from  
11 different socioeconomic status groups, kids from  
12 different parts of the United States and from  
13 different countries, is that when you see  
14 associations consistent in different study  
15 populations and over different time periods, that  
16 is actually reassuring even if the average  
17 level -- the average blood lead level in a child  
18 in 1995 in Egypt might be quite far off from a  
19 child in this study.

20 That doesn't mean that that study is not  
21 informative at all.

22 MR. KLATT: Okay. Object to the  
23 responsiveness of the answer after "I can't  
24 confirm or deny that, off the top of my head," and  
25 move to strike.

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1 Q. Are you aware of any studies, whether you  
2 cited them in your report or not, that indicate  
3 that blood lead levels in developing countries are  
4 associated with ASD or ADHD but not blood lead  
5 levels in the United States?

6 A. We saw -- in this literature base, there  
7 were associations in different countries. Like  
8 what I -- when you look at the ADHD literature, it  
9 is more consistent than any other literature that  
10 I've actually probably ever reviewed in my career.

11 The amount of consistency in the lead and  
12 ADHD literature is probably actually just as  
13 consistent if not more than the literature I have  
14 seen in terms of smoking and stroke risk.  
15 Everyone knows smoking causes stroke. You ask any  
16 stroke neurologist, smoking causes stroke.

17 Still, the literature on that association  
18 is less consistent than what we see in lead and  
19 ADHD here across so many different study  
20 populations.

21 All the studies on lead and ADHD, they  
22 were not all conducted on white middle-class  
23 children in Chicago in the early aughts. They  
24 were studied in all different populations. And  
25 you see it again and again and again to the point

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1 where as an epidemiologist the consistency was  
2 truly remarkable.

3 Q. Let me ask you the question again.

4 Were you aware of any studies that you  
5 reviewed that showed that the blood lead levels in  
6 developing countries were associated with ASD and  
7 ADHD but not the blood lead levels in the United  
8 States? Were you aware of any such specific  
9 studies? That's all I'm asking.

10 A. That looked at children in some countries  
11 and not in other countries --

12 Q. That reviewed studies in developing  
13 countries, reviewed studies in the United States,  
14 found an association between blood lead levels in  
15 developing countries and ASD and ADHD, but didn't  
16 find that association in the United States.

17 Are you aware of any specific studies that  
18 showed that?

19 A. So what you would be asking about is,  
20 like, meta-analyses and review studies. So I'd  
21 have to look back.

22 What we do in meta-analyses --

23 Q. I just need to know whether you recall any  
24 such studies. I don't need to know --

25 MR. ESFANDIARY: Please.

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1 questions and answer them as an epidemiologist to  
2 the best that I can.

3 I can look through the reports so that I  
4 don't misrepresent the literature.

5 But sometimes in meta-analyses what we'll  
6 do is we'll look at meta-regressions, were the  
7 associations stronger in boys than in girls, in  
8 older time period versus more recent time period.

9 We often do that to try to get a sense of  
10 was the association stronger when the association  
11 levels were stronger.

12 Q. Do you recall seeing any studies,  
13 meta-analysis, whatever type, that showed  
14 increased risk of ASD and ADHD in arsenic or lead  
15 exposed children in developing countries but that  
16 same study didn't show that increase in U.S.  
17 studies? Are you aware of any such studies or  
18 not, as we sit here?

19 A. Are you saying I'm not allowed to look at  
20 my report?

21 Q. I'd just like to know, because you can  
22 spend hours looking at your report, I'd just like  
23 to know, off the top of your head, are you aware  
24 of such studies? Have you seen or reviewed such  
25 studies, to your recollection?

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1 MR. KLATT: Come on, she's way beyond the  
2 question.

3 MR. ESFANDIARY: She's answering the  
4 question. Stop interrupting the witness, please.

5 MR. KLATT: I want responsive answers.

6 MR. ESFANDIARY: She --

7 Q. I simply asked you whether you were aware  
8 of any studies, whether they want to be  
9 meta-analysis or whatever, that show increased  
10 risks in developing countries but not in the  
11 United States?

12 If you're aware of such studies, great.  
13 If you're not, I don't need to know what you do  
14 when you review meta-analyses.

15 MR. ESFANDIARY: Objection.

16 Q. Are you aware of any such studies?

17 A. My answers are what they are no matter  
18 what they are. They are my truth.

19 And I'm doing my best to be as responsive  
20 to your -- the way you're asking questions to the  
21 best that I can be. I just want to be clear about  
22 that.

23 Whether they're found legally to be  
24 unresponsive or not, I don't know. I'm doing my  
25 best to interpret as an epidemiologist your legal

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1 A. I feel like you're asking me to have  
2 memorized this and give an answer without looking.  
3 And I was told that I would be able to sort of  
4 refer to it.

5 So I don't feel comfortable guessing,  
6 remembering things off the top of my head without  
7 confirming.

8 Q. I'm not asking you to guess. I'm asking  
9 if you remember without having to refer to your  
10 report.

11 A. To be responsible as a scientist, I  
12 would -- the most responsible thing would be to  
13 refer to my report.

14 Can we take a break for five minutes  
15 before you put another --

16 Q. Sure. Let me just ask, no study of that  
17 nature comes to mind as you sit here without  
18 looking at your report. Is that correct?

19 A. I would have to look at my report because  
20 there have been -- there have been  
21 meta-regressions by country. But in order to  
22 accurately as a scientist answer your questions --  
23 I don't think you want me to not be doing that.

24 Q. I just want you -- I just want you to  
25 respond to the question asked. That's all I'm

1 asking.

2 A. And I want to be responsible here, which  
3 would require looking at my report. I'm happy to  
4 do that after the break if you still want me to.

5 MR. KLATT: Let's take a break.

6 THE VIDEOGRAPHER: This concludes Media  
7 Number 6. Going off the record, 4:13 p.m.

8 (Recess, 4:13 p.m. to 4:30 P.M.)

9 THE VIDEOGRAPHER: This is the beginning  
10 of Media Number 7. Going back on the record,  
11 4:30 p.m.

12 BY MR. KLATT:

13 Q. We're back on the record, Dr. Gardener.  
14 Are you doing okay?

15 A. I am.

16 Q. Can you name for me any medical or  
17 scientific organization that has concluded that  
18 consumption of baby food causes ASD or ADHD?

19 A. I haven't -- as far as I know, no  
20 scientific organization has looked at it.

21 What's relevant here is the lead and the  
22 arsenic. I haven't seen any organization -- any  
23 scientific organization confirm or deny any risk  
24 factor for autism or ADHD or, like, you know,  
25 dementia, for example.

1 cause ASD or ADHD?

2 A. I haven't seen any sort of review of baby  
3 food or food related to any outcome.

4 Q. Can you name any psychiatric or neurologic  
5 organization -- and you're in the department of  
6 neurology -- who's concluded that consumption of  
7 baby food can cause ASD or ADHD?

8 A. I am an associate professor in the  
9 department of neurology, and I've never seen any  
10 neurological association sort of write anything  
11 like that for food in relation to any neurological  
12 condition or any other environmental risk factor  
13 in relation to any neurological condition. I  
14 haven't seen any sort of similar kinds of reports  
15 in any way.

16 Q. Including ASD or ADHD. Correct?

17 A. Yeah. I haven't seen any reports on any,  
18 you know, risk factors of any kind in relation to  
19 ASD or ADHD, food in relation to any outcome,  
20 other environmental risk factors in terms of any  
21 outcomes.

22 If you have an example of, like, a -- you  
23 know, something totally unrelated that would be  
24 similar --

25 Q. My question is specific to ASD and ADHD.

1 Q. So you can't name any medical or  
2 scientific organization, as we sit here today,  
3 that has concluded that consumption of baby food  
4 causes ASD or ADHD. Correct?

5 A. I haven't seen any medical organization go  
6 through the process of determining -- looking at  
7 that. So what their conclusion would be, I  
8 haven't even seen them, like, investigate that  
9 question or other risk factors for autism or ADHD  
10 or other -- or other outcomes.

11 I haven't -- they could exist. They could  
12 exist for dementia.

13 Q. My question specifically is, can you name  
14 one?

15 A. I haven't looked.

16 Q. Okay. Can you name any regulatory  
17 authority in any country, anywhere in the world,  
18 that's concluded that consumption of baby food  
19 causes ASD or ADHD?

20 A. So I wasn't making the distinction between  
21 regulatory or medical authority. I haven't seen  
22 any that have looked into it, concluded it one way  
23 or another, for food or for any other risk factor.

24 Q. Can you name any pediatric society that  
25 has concluded that consumption of baby food can

1 And you can't name a neurologic or psychiatric  
2 society that has concluded that baby food  
3 consumption causes ASD or ADHD. Correct?

4 A. I haven't seen anything -- I haven't  
5 looked, but I haven't seen any organization make  
6 any conclusions about any risk factors for those  
7 outcomes or other neurological outcomes.

8 Q. And that would also include any  
9 nutritional society or organization. Correct?

10 A. So I haven't seen any nutritional society  
11 comment on any sort of specific foods in relation  
12 to ASD, ADHD, any other neurological outcome or  
13 cardiovascular outcome.

14 Q. Are you aware of any medical textbook that  
15 has concluded that consumption of baby food causes  
16 ASD or ADHD?

17 A. I haven't read a medical textbook, you  
18 know, looking at anything like that.

19 Q. There's no medical, scientific, or  
20 regulatory organization that has recommended that  
21 parents stop feeding their kids commercial baby  
22 food. Correct?

23 A. I have seen organizations -- I'll find it  
24 here.

25 So on page 110 of my report I wrote, "The



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1 CDC and the FDA have both provided multiple  
2 warnings about the potential for lead in baby food  
3 to have grave health consequences for babies who  
4 consume them.

5 "In 2023, it was recognized that cinnamon  
6 applesauce pouches alone were causing high blood  
7 lead levels in babies, widespread across the U.S.,  
8 prompting recalls of multiple brands of cinnamon  
9 applesauce and repeated warnings about lead  
10 contamination in these baby food items by the FDA  
11 and CDC.

12 "In relation to lead contamination in  
13 cinnamon applesauce pouches, the CDC warned  
14 consumers to avoid eating any amount of the  
15 recalled applesauce pouches, acknowledging that  
16 there was no safe amount of these to consume of  
17 these due to the lead contamination.

18 "Public health agencies provided no  
19 reassurance about how much of these pouches was  
20 safe for babies to consume. Rather, they made it  
21 clear that any consumption amount was a cause for  
22 concern.

23 "This situation provided clear recognition  
24 that lead contamination in food marketed to babies  
25 can cause lead toxicity and that there was no safe

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1 amount to consume.

2 "In relation to the contamination of  
3 applesauce pouches with lead, the FDA wrote: Lead  
4 is toxic to humans and can affect people of any  
5 age or health status, protecting children from  
6 exposure to lead is particularly important because  
7 they are more susceptible to lead toxicity.

8 "Most children have no obvious immediate  
9 symptoms. Parents and caretakers should consult a  
10 healthcare provider if you suspect a child may  
11 have been exposed to lead.

12 "Short-term exposure to lead could result  
13 in the following symptoms: headache, abdominal  
14 pain, colic, vomiting, anemia.

15 "Longer-term exposure could result in the  
16 following additional symptoms: irritability,  
17 lethargy, fatigue, muscle aches, or muscle  
18 prickly, burning, constipation, difficulty  
19 concentrating, muscular weakness, tremor, and  
20 weight loss.

21 "In relation to the consumption of  
22 lead-contaminated applesauce pouches, the CDC  
23 wrote the following: No safe level of lead in  
24 children's blood has been identified. Lead  
25 toxicity primarily targets the central nervous

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1 system. Children are more vulnerable to lead  
2 poisoning than adults because their nervous  
3 systems are still developing. Children also tend  
4 to absorb a higher fraction of ingested lead than  
5 adults.

6 "Although children with lead exposure may  
7 have no apparent acute symptoms, even low levels  
8 of lead have been associated with learning,  
9 behavioral, and cognitive deficits. A child who  
10 is exposed to large amounts of lead may develop  
11 acute lead poisoning, presenting with  
12 gastrointestinal, hematological, and neurological  
13 effects, including one or more of the following  
14 signs and symptoms."

15 Q. That's far beyond the question I asked.

16 MR. ESFANDIARY: Hang on.

17 MR. KLATT: She's talking about symptoms  
18 now and I asked about regulatory recommendations.

19 MR. ESFANDIARY: She was responding to  
20 your question.

21 MR. KLATT: No. She's just reading ad  
22 nauseam. We're far beyond the question.

23 Q. So can we go back --

24 A. I thought that was -- do you want to  
25 repeat the question again?

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1 MR. ESFANDIARY: I want to be very clear.  
2 Dr. Gardener was in the process of answering  
3 Counsel's question. He interrupted her,  
4 preventing her from answering the question.

5 But you can go ahead and ask your next  
6 question.

7 MR. KLATT: Thank you.

8 Q. You're aware what you're reading from your  
9 report relates to specific recalls of highly  
10 contaminated individual products and doesn't apply  
11 to baby food as a whole? Do you understand that?

12 A. So it was in relation to, in 2023,  
13 lead-contaminated cinnamon applesauce pouches from  
14 certain brands.

15 You asked me -- I thought I was being  
16 responsive to your question. Do you want to  
17 repeat your question?

18 Q. Yes. There's no medical, scientific, or  
19 regulatory organization in the world that has  
20 recommended that parents stop feeding children  
21 commercial baby food. Correct?

22 A. Yes. So the CDC and FDA have issued very  
23 clear warnings that parents of children stop  
24 feeding their children these baby foods. In fact,  
25 they told people to be cautious when cleaning up



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1 these baby foods. Not just eating it but eating  
2 any amount. Any amount, they said, can cause harm  
3 and even cleaning it should be done with caution.

4 Q. You recognize those CDC and FDA statements  
5 in that particular year related to a particular  
6 contaminated product -- in fact, not to the food  
7 but to the cinnamon spice used in the food that  
8 originated in South America and that was in  
9 relation to a specific recall.

10 My question isn't about a specific product  
11 that's highly contaminated. I'm talking about  
12 commercial baby foods that virtually every child  
13 in the United States consumes on a regular basis.

14 There's no medical, regulatory, or  
15 scientific organization in the U.S. or anywhere in  
16 the world that has told parents to stop eating  
17 commercial baby food because of heavy metals.  
18 True?

19 A. No, that's not true. Even more so, first  
20 of all, I want to correct something. You said it  
21 wasn't due to the food. It was due to the  
22 cinnamon in the food.

23 Cinnamon is food. It's not like they were  
24 talking about the cap of the food or the lining of  
25 the pouch. They were talking about -- the

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1 cinnamon is part of the food. It's an ingredient.  
2 It's a listed ingredient. So I want to make that  
3 point clear.

4 Second of all, the FDA starting in January  
5 of this year now has new regulatory guidelines  
6 about not just the consumption but the sale of  
7 specific baby foods. They have new regulations  
8 about the amount of lead that can be sold in  
9 different categories. I think it's 20 parts per  
10 billion for, like, cereals and 20 parts per  
11 billion for single-ingredient root vegetables and  
12 10 parts per billion for everything else.

13 So it should be understood that if those  
14 products should not be sold they should also not  
15 be consumed, I would say emphatically.

16 Q. Has the FDA said to parents stop feeding  
17 your children commercial baby food, period?

18 A. The FDA in that guidance made it very  
19 clear that children should not be eating baby  
20 foods outside of those guidelines. And they made  
21 it very clear that a pretty high proportion of  
22 baby foods on the market in the past actually  
23 wouldn't adhere to those guidelines.

24 Q. Has FDA required those products to be  
25 recalled?

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1 MR. ESFANDIARY: Which products?

2 Q. The products you just referred to that  
3 don't meet those guidelines. Or are they still on  
4 the shelves?

5 MR. ESFANDIARY: Which manufacturer?  
6 Which product?

7 MR. KLATT: Any manufacturer.

8 A. I will find the -- they had made it very  
9 clear that those products should be considered  
10 adulterated.

11 Q. They have not said stop feeding your  
12 children commercial baby foods because of heavy  
13 metal consumption. Correct?

14 A. They have said they should not be sold.  
15 So it's very clear if they -- they're only being  
16 sold to be eaten. So if they shouldn't be sold,  
17 then they shouldn't be eaten.

18 They are adulterated. The FDA has made it  
19 very clear that not just are they regulating this,  
20 but actually this is just their starting point.  
21 That their goal of protecting children from lead  
22 contamination in baby foods, this is just  
23 starting. And these levels are harmful. And  
24 these levels, products with these levels in the  
25 past are widely on the shelves.

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1 Q. They didn't conclude that those levels  
2 caused any level of harm. That's just levels  
3 below which they recommended that people make.  
4 Correct?

5 A. I'll read some excerpts of it.

6 Q. That's fine. I withdraw the question.

7 A. Okay.

8 Q. Has the American Academy of Pediatrics  
9 told American parents to stop feeding their  
10 children commercial baby foods?

11 A. I don't know.

12 Q. You haven't seen that?

13 A. I haven't seen their guidance about this.  
14 No.

15 Q. Do you agree with me, changing the  
16 subject, that temporality is a component of  
17 determining causality. Right?

18 A. Temporality is part of the Bradford Hill  
19 criteria that I wrote about extensively in my  
20 report.

21 Q. And exposure must precede outcome to meet  
22 the temporality requirement. Correct?

23 A. So in order for an exposure to cause an  
24 outcome, it has to occur before the outcome.

25 But oftentimes in epi studies the exposure

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1 is understood to occur before the outcome, but the  
2 measurement of it can occur later. It can occur  
3 concurrently. And we often do this.

4 As you so beautifully emphasized  
5 throughout the day, you were talking about how  
6 lead and arsenic exposure starts in utero and  
7 continues for all of the in utero period and  
8 infancy and childhood. And that is so important  
9 here because it speaks to this whole temporality  
10 issue.

11 You realize this lead and arsenic exposure  
12 is not something that babies and children are only  
13 exposed to later on when some of these studies  
14 were conducted.

15 These are exposures that they've had their  
16 whole life. If children were never exposed to  
17 lead and arsenic until the age of 2, we wouldn't  
18 be sitting here. I hold myself and my scientific  
19 standards to a really, really high standard. And  
20 if we were talking about an exposure that nobody  
21 was exposed to until later on in life, I would not  
22 have the confidence to be reporting this in the  
23 way that I am.

24 Temporality is very important. The fact  
25 that lead and arsenic exposure is a lifelong

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1 exposure from the in utero period and throughout  
2 infancy provided a lot of -- I should say it  
3 really informed my opinion here.

4 MR. SACHSE: Motion to strike everything  
5 after "So in order for an exposure to cause an  
6 outcome, it has to occur before the outcome."

7 Thank you.

8 MR. KLATT: Can you mark this.

9 (Exhibit 10 marked for identification)

10 Q. I'm going to show you something I  
11 prepared. And it's a question I'm going to ask  
12 you.

13 Can you cite for me, Dr. Gardener, any  
14 published epidemiologic study on lead or arsenic  
15 exposure from any source, an ASD risk that meets  
16 the following four criteria:

17 Number 1, exposure in the six months to  
18 three-year-old time period.

19 Number 2, exposure to doses of lead and  
20 arsenic one might reasonably get from baby food.

21 Number 3, an increase in the diagnosed  
22 outcome of ASD.

23 And Number 4, in a population of U.S.  
24 children?

25 MR. ESFANDIARY: Do you have an extra copy

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1 of that?

2 MR. KLATT: Sure.

3 MR. ESFANDIARY: Thank you.

4 Q. As you sit here today, can you cite a  
5 study that you've seen, that you've cited or not  
6 cited, that meets those four criteria? And if so,  
7 which one?

8 A. First of all, babies -- children in -- the  
9 majority of the children in all of these studies  
10 that I have cited were exposed to lead and arsenic  
11 within the first three years of life. You talked  
12 about that earlier, that maybe not every single  
13 child in every single study, but we're talking  
14 about lead and arsenic being ubiquitous.

15 In these studies, kids were all exposed  
16 during this time period. Also, the exposure  
17 levels in a lot of these studies were extremely  
18 low. Extremely low. And similar to or even less  
19 than the amount that was estimated in Dr. Jones  
20 from the hypothetical menus and from the studies  
21 that I conducted in terms of lead exposure in baby  
22 food and what sort of understood from food in  
23 general including baby food to have lead, not  
24 every single study showed an association with  
25 autism.

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1 But as I showed in my report, many did.  
2 And some of the studies were conducted in the  
3 United States and some were not.

4 I would have to -- I don't think I have  
5 time right now to go through and say which ones  
6 were in the United States and which ones were not.

7 MS. FOUHEY: Move to strike as  
8 nonresponsive.

9 MR. ESFANDIARY: She literally just  
10 answered the question perfectly, point by point.

11 What are you talking about? Maybe I'm  
12 losing it.

13 Ask your next question.

14 Q. You answered different studies for  
15 different criteria. I'm asking for any published  
16 epidemiologic study that met all four of these  
17 criteria, exposure in the six month to  
18 three-year-old time period --

19 A. All of them.

20 Q. -- exposure to doses of lead and arsenic  
21 one might reasonably get from baby food.

22 A. Almost all of them.

23 Q. An increase in the diagnosed outcome of  
24 ASD, not just symptoms.

25 A. Not all of them but a good number.

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1 Q. And I'm asking for a single study in a  
2 population in the United States.

3 A. Not all, but a good number. I'd have to  
4 look.

5 Q. Can you name one study that meets all four  
6 of those criteria?

7 A. I'd have to look. Not off the top of my  
8 head, but yeah. I mean, of course. As you talked  
9 about earlier, these exposures are ubiquitous.

10 Q. We'll leave a blank in your deposition.  
11 When you find that study that meets all four  
12 criteria -- I'm not talking about five studies  
13 that meet one, six studies that meet another.

14 A. Sure, yeah, tons.

15 Q. I'm talking about one study from the  
16 United States that meets all four of those  
17 criteria, if you would provide it as part of this  
18 transcript.

19 MR. ESFANDIARY: No, she's not going to go  
20 back and do additional homework. This is your  
21 chance to ask questions. She's literally just  
22 responded to your question. I know you don't like  
23 it.

24 MR. KLATT: I'm not going to sit here for  
25 three hours --

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1 MR. ESFANDIARY: Calm down, wait for a  
2 question.

3 She's not going to do any homework. This  
4 is your time to ask questions, so wrap it up.

5 MR. KLATT: I'm not going to sit here and  
6 let her go through a hundred-page report for three  
7 hours.

8 MR. ESFANDIARY: Then don't ask a  
9 ridiculous question.

10 MR. KLATT: No, that's a very simple  
11 question. That's a foundational question.

12 MR. ESFANDIARY: It's a simple question?  
13 You made an exhibit about it.

14 MR. KLATT: You're interrupting me now.  
15 I'm asking if she can name, as she sits  
16 here, a single study that meets those four  
17 criteria. If she can't without referring to her  
18 report, that's fine. I just want to know that.

19 A. I can't refer -- if you had asked me any  
20 question -- I'm horrible with names. I don't  
21 remember the names and the dates other than if it  
22 was me, and like I said earlier, sometimes not  
23 even if it was me. If you had asked me a set of  
24 criteria and asked me about my own research, I  
25 would have to look at those.

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1 So I don't think it's reasonable for a  
2 scientist to be able just to look at all those and  
3 be like, you know, Joe Smith, 2018.

4 BY MR. KLATT:

5 Q. When you testify in front of Judge Corley  
6 in December, if you do, are you going to sit there  
7 and go through hundreds of pages of your report to  
8 answer questions she may have?

9 MR. ESFANDIARY: Calls for speculation as  
10 to what's going to happen six months from now.

11 A. All I can do in front of Judge Corley is  
12 my best. I wouldn't make things up. Like, if  
13 Judge Corley asked me this question, I wouldn't  
14 just say, you know, Joe Smith, 2018.

15 I'm a human. I will be sworn in that day  
16 and I will do everything to the best of my  
17 ability, knowing that at the end of the day I need  
18 to be professional as a scientist and I need to  
19 do . . .

20 I would say to her, you know, if she was  
21 asking the question, I need to look at the papers.  
22 I need to -- if that isn't allowed, then I don't  
23 know how to answer the question.

24 I would simply just have to answer  
25 honestly. And that would be me being the most

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1 responsive. I understand that's not the answer  
2 you want.

3 Q. No. I just want an honest answer, what  
4 you think you'll do if you're asked that same  
5 identical question by Judge Corley.

6 A. So I've never been -- I guess I have been  
7 in front of a judge. I had the Sargon hearing.  
8 So maybe it's similar. I didn't have any issues.  
9 The Sargon hearing for me went great. I haven't  
10 run into any sort of problems. But I would be  
11 honest with the judge and ask her how I'm supposed  
12 to proceed.

13 Q. If you'd look at Exhibit 10. I believe  
14 that's what we're looking at. Is that correct?

15 A. Yes.

16 Q. And if I just changed in that question ASD  
17 to ADHD so that it read, "Can you cite for me, as  
18 you sit here today, any published epidemiologic  
19 study on lead or arsenic exposure from any source  
20 and ADHD risk that meets all of the following four  
21 criteria:

22 Number 1, exposure in the six months to  
23 three-year-old time period.

24 Number 2, exposure to doses of lead and  
25 arsenic one might reasonably get from baby food.

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1 Number 3, increase in the diagnosed  
2 outcome of ADHD.

3 And Number 4, in a population of U.S.  
4 children.

5 Can you name such a study, sitting here  
6 today, without referring to your report?

7 A. I would have to refer to my report to be  
8 most responsible. I mean, not doing so would just  
9 not be -- you know, I had an oath here. I don't  
10 want to be incorrect with any of my statements.  
11 It's very important to me to be 100 percent  
12 correct.

13 Q. I understand. And I would imagine if  
14 there was such a study you could cite it off the  
15 top of your head. But if you can't --

16 A. Absolutely not. Some people could. Some  
17 people could. It would absolutely not be me. I'm  
18 horrible with names. And it would just not be  
19 responsible.

20 Q. Do you understand almost 100 percent of  
21 lead in the bloodstream is contained within red  
22 blood cells?

23 A. I am not prepared to opine on that.

24 Q. Okay. Do you know the lifespan of a human  
25 red blood cell that contains lead?

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1 A. I do not know. I'm not prepared to opine  
2 on that. It's not part of my charge, not part of  
3 what I looked at.

4 Q. Do you know that the lifespan of a red  
5 blood cell is approximately 120 days?

6 A. If you want to show me, I'm happy to look,  
7 but I can't --

8 Q. Do you know one way or the other?

9 A. I can't confirm or deny that fact. I did  
10 not come prepared to talk about the lifespan of a  
11 red blood cell.

12 Q. Can you tell us whether measuring blood  
13 in -- excuse me -- measuring lead levels in blood  
14 and arriving at a level tells you about a lead  
15 exposure that precedes 120 days?

16 A. I am not prepared, I guess, to -- I guess  
17 you were a little bit broad in just asking me to  
18 talk about it.

19 Q. I just want to know whether you know, one  
20 way or the other.

21 A. I guess I'm not prepared to talk about the  
22 amount that would be there after that period of  
23 time.

24 Q. I'm just wondering when you rely on these  
25 studies that have blood lead levels in them, how

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1 far back do you assume that blood level reflects  
2 exposure to lead?

3 A. Earlier you brought up the important point  
4 that you called it sequestered. I never used that  
5 word. It can be -- lead can be stored in bones  
6 and be rereleased. So I think that's what you're  
7 asking about.

8 And yes, I agree with you that lead in  
9 your blood is not just indicative of very recent  
10 exposure but it can be -- it can reflect past  
11 exposure that is, as you called it, sequestered in  
12 the bones and then released.

13 Q. If you --

14 A. If that's what you're asking about.

15 Q. If you have a blood lead level that's  
16 measured at the time or after your ASD diagnosis,  
17 does that give you any information at all about  
18 when that person was exposed to that lead?

19 A. So as you so rightfully pointed out many  
20 times, children are exposed to lead every day.  
21 Lead is ubiquitous.

22 But what really matters is how much lead,  
23 the variability of lead. And that can change over  
24 time. So the exposure -- the exposure tends to be  
25 higher in children and babies than adults, but not

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1 necessarily. Some people are more exposed as  
2 adults than when they were younger. And there is  
3 variability.

4 Q. My question is very simple. If you get a  
5 blood lead level measurement, let's say today, can  
6 you pinpoint when you were exposed to the lead  
7 that resulted in that blood level?

8 A. Like you said, you're exposed all the  
9 time. So your blood lead level today represents  
10 the burden of lead in your blood right now. The  
11 exposure may reflect, you know, exposures from the  
12 past, including that day, the past month, farther  
13 back, but it will vary day by day.

14 Q. If a child has a blood lead level measured  
15 at four years of age, does that tell you what the  
16 child's blood level was under one year?

17 A. So it would vary day by day. It would be  
18 over time. Typically in these sort of studies we  
19 don't measure, you know, blood lead levels every  
20 single day. When we go to the doctor, we measure  
21 it a couple times in a childhood because that is  
22 thought to be relevant.

23 It's not like some exposures where, you  
24 know, it's literally eliminated within hours.

25 And if you're talking about a relevant

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1 source, there tends to be some variability but  
2 also a lot of correlation over time.

3 It might not be perfectly representative  
4 of a week before. But on a population-wide level,  
5 it's highly correlated.

6 Q. But a blood lead level in a four-year-old  
7 or a seven-year-old or an eight-year-old tells you  
8 nothing about when the exposure to that lead  
9 occurred. Correct?

10 A. So the exposure to lead happens all the  
11 time.

12 Q. And a blood lead level taken of a child at  
13 four or seven or eight years of age or any age  
14 doesn't tell you the source of the lead. Correct?

15 A. Your blood lead level represents the body  
16 burden and it doesn't say whether that blood lead  
17 level is from water or from the apples you eat or  
18 the spinach that you eat or the house paint or  
19 reflects how much prenatal exposure.

20 Just like this is true for other  
21 environmental exposure. So for example, PFAS,  
22 which is what I study. When we look at the serum  
23 concentrations of PFAS, we can't tell if the PFAS  
24 comes from the person's couch or the food that  
25 they're eating or the water that they're drinking

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1 or from their car. It doesn't actually matter  
2 because what matters is the neurotoxicant, not as  
3 much the exposure.

4 The exposure does matter in terms of  
5 actions people can take and regulations that can  
6 happen on a population-wide level to protect  
7 ourselves.

8 Q. My question is simply, and I think you may  
9 have just answered it, getting a measurement of a  
10 blood lead level or an arsenic level doesn't in  
11 and of itself identify where that exposure came  
12 from. Correct?

13 A. That is correct. It doesn't show what  
14 foods or what sources. It doesn't really need to.  
15 What it does is it -- for these studies, it shows  
16 the association between the neurotoxin itself and  
17 the outcome, which is what's relevant here.

18 And when I talk to, say, clients who  
19 they'll have a high blood lead concentration in  
20 their children, they want to be thinking about all  
21 exposure sources that they can eliminate.

22 And what I tell my clients is even if your  
23 blood lead level is nondetect, you still want to  
24 be identifying exposure sources and reducing them  
25 because there is no safe level of lead.

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1 Q. Have you, yourself, published any  
2 recommendations or advised any of your colleagues  
3 at the University of Miami that parents should  
4 avoid feeding their children commercial baby  
5 foods?

6 A. I don't think I've ever talked to any of  
7 my colleagues, given them advice about what their  
8 kids should eat.

9 I'm in the neurology department. None of  
10 my colleagues treat children. My colleagues are  
11 all older than me. I can't think of anyone who's  
12 actually had children after me. I don't like  
13 telling people what they should eat themselves or  
14 other people other than sort of in a -- like a  
15 professional setting.

16 Nobody has ever asked me or I never told  
17 them, you know, feed this to your kids, feed that  
18 to your kids.

19 First off, I can't think of any colleague  
20 who had a baby after me.

21 Q. So you haven't gone to any of your  
22 colleagues, young or older, whether they're  
23 research assistants or whatever, and said, "I've  
24 been doing a lot of reading. I'm very concerned  
25 about heavy metals in baby foods, and you should

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1 avoid feeding your children those"?

2 A. I can think of one colleague who maybe I  
3 have talked to about her grandchildren.

4 Q. Who is that?

5 A. My colleague named Bonnie.

6 Q. In your department?

7 A. Yeah.

8 Q. Bonnie who?

9 A. Bonnie Levin.

10 Q. And what did you tell her?

11 A. We have talked about -- she's very much on  
12 the same page as I am about heavy metal toxicity,  
13 and we've talked about heavy metals in various  
14 food sources.

15 Q. Does Bonnie feed her grandchildren  
16 commercial baby food?

17 A. She doesn't really feed her grandchildren.

18 Q. Do you know whether she knows if her  
19 grandchildren are even fed commercial baby food?

20 A. I don't know.

21 Q. Do you agree that baby foods are complex  
22 mixtures that contain vitamins and nutrients that  
23 are known to be beneficial for healthy brain  
24 development?

25 MR. ESFANDIARY: Objection, overbroad,



1 nonspecific.

2 A. There's a lot of parts to that question.

3 So some baby foods are simple; they'll  
4 just be a single ingredient. And other baby foods  
5 have multiple ingredients. Some will have  
6 cinnamon, like I talked about earlier. A lot of  
7 the applesauce pouches have cinnamon. I don't  
8 know if you would call that a complex mixture.

9 But there will be -- some baby foods are  
10 just one ingredient and some baby foods are  
11 multiple ingredients. The amounts of their  
12 nutrients will vary.

13 Q. Do you consider yourself to be an expert  
14 on baby food nutrient and nonnutrient interactions  
15 in the body?

16 A. I talked about this in this report. Like  
17 I've said many times, my understanding of what is  
18 an expert is someone who knows a lot more than the  
19 general public. I would say I know a lot more  
20 than the general public about this. I touched on  
21 it in my report. There's a whole section about  
22 it.

23 Q. Have you ever held yourself out to your  
24 colleagues as an expert in the interaction between  
25 nutrient and nonnutrient components of food?

1 A. I have never held myself out as an expert  
2 to my colleagues on anything. That just sounds  
3 very like an awkward thing to do. My colleagues  
4 recognize me as an expert on diet.

5 I can't imagine being like, "Hey, guys,  
6 I'm the expert in diet. They have more said to  
7 other people, "Hannah, you know, is an expert on  
8 diet."

9 Q. Have you published on -- any publications  
10 on how nutrients and nonnutrients interact in  
11 food?

12 A. How nutrients interact? I can't think of  
13 a paper of mine that -- I don't think -- I'm not  
14 trying to be nonresponsive, but I can't think of a  
15 paper of mine that would probably fit what you're  
16 asking.

17 Q. That's very responsive. That's the most  
18 responsive answer you've given today.

19 A. Then our definitions of what's responsive  
20 are very different.

21 Q. You don't consider yourself a  
22 nutritionist. Correct?

23 A. I don't call myself a nutritionist. I do  
24 call myself a nutritional epidemiologist.

25 Q. And on your web page, do you say you're a

1 nutritional epidemiologist with the University of  
2 Miami?

3 A. I have no idea. A friend created my  
4 website over a decade ago. I have no idea what it  
5 says. It's so dated.

6 Q. Where have you held yourself out in public  
7 as a nutritional epidemiologist?

8 A. I guess -- I'm not really allowed to talk  
9 about those meetings. I've called myself a  
10 nutritional epidemiologist to other scientists  
11 when sort of describing my expertise before.

12 Q. That's just verbal descriptions as opposed  
13 to something that you've, like I said, put on your  
14 website or your resume?

15 A. I have no idea what my website says.

16 My resume speaks for itself. I've  
17 published a ton on nutritional epidemiology.

18 Q. I don't think I saw a nutritional  
19 epidemiologist on your CV, but you can correct me  
20 if I'm wrong.

21 A. What did I put on my CV? I don't see a  
22 spot where I would have put that or anything, but  
23 maybe I don't understand, like, the section that  
24 you'd be looking for.

25 What did I say myself?

1 Q. Did you represent in your CV that you're a  
2 nutritional epidemiologist?

3 A. I guess like where have I represented  
4 myself as something -- I don't recall an area of  
5 my CV where I'm like I am an environmental  
6 epidemiologist. I am a nutritional  
7 epidemiologist. I am an epidemiologist. I just  
8 don't -- I did say, you know, I'm a research  
9 associate professor. I put in parentheses  
10 epidemiology in the department of neurology. I  
11 said I'm the director of the biostatistics core.  
12 I wrote that I have a doctorate of science in  
13 epidemiology.

14 I don't see a place where I have said I am  
15 an epidemiologist. I am an epidemiologist, in  
16 fact, but I don't see anywhere where I have said a  
17 sentence like "I am an epidemiologist" or "I am an  
18 environmental epidemiologist, a  
19 neuroepidemiologist, a nutritional  
20 epidemiologist."

21 One thing we do when we write grants is we  
22 don't submit our whole CV. We submit what we call  
23 a bio sketch, which is a very, very condensed  
24 version of that. We often include a personal  
25 statement.



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1 And that's a spot where I have included,  
2 you know, things like I am a nutritional  
3 epidemiologist or I am an environmental  
4 epidemiologist or a neuroepidemiologist, depending  
5 on sort of the topic of --

6 Q. Your testimony is you have represented  
7 yourself as a nutritional epidemiologist in such a  
8 document?

9 A. I have represented myself definitely as a  
10 nutritional epidemiologist online. I've  
11 represented it -- myself informally, formally, in  
12 many different places.

13 Q. Have you conducted any analysis comparing  
14 the eating behaviors of children with and without  
15 autism?

16 A. I have not published a study on eating  
17 behaviors comparing children with and without  
18 autism.

19 Q. Are restricted eating patterns and  
20 essential nutrient deficiencies in children with  
21 ASD a plausible biological mechanism by which  
22 children with ASD have higher lead and arsenic  
23 levels than children without ASD?

24 A. Could you say that again?

25 Q. Sure. Are restrictive eating patterns and

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1 essential nutrient deficiencies in children with  
2 ASD a plausible biological mechanism by which  
3 children with ASD have higher lead or arsenic  
4 levels than children without ASD?

5 A. So I did talk about how lead competes  
6 with, like -- with iron and calcium receptors and  
7 can impact those levels. I have talked about that  
8 a bit in the report.

9 I've also talked about how I considered  
10 the possibility of restricted eating patterns and  
11 whether those could be associated with increased  
12 or decreased lead or arsenic exposures.

13 I have not seen any evidence to confirm or  
14 refute that, but I did consider that possibility.  
15 I didn't see any evidence, but that was something  
16 that was important for me to think about.

17 But I think what you were saying is, is  
18 one possibility of the way that lead and arsenic  
19 and particularly lead is neurotoxic is the fact  
20 that it competes for binding sites with calcium  
21 and iron.

22 Q. No, that's not what I'm asking.

23 I'm asking if the feeding patterns and  
24 food selectivity that is more common in children  
25 with ASD than children without may affect their

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1 blood lead levels. Do you know one way or the  
2 other?

3 A. Like I said, I haven't seen any evidence  
4 to confirm or refute the fact that these selective  
5 eating patterns or eating habits are -- tend to be  
6 higher in lead or arsenic or lower in lead or  
7 arsenic. Yeah.

8 I mean, you know, what we see is that  
9 children with ASD and ADHD, they have higher body  
10 burden of lead.

11 And that doesn't necessarily indicate the  
12 source nor does it indicate the role of genetics  
13 that's impacting how long those toxic heavy metals  
14 stay in the body, how they distribute, how they're  
15 detoxified.

16 Q. So does that mean -- do you believe that  
17 genetic changes that result in autism can also be  
18 genetic changes that affect children's metabolism  
19 of heavy metals?

20 A. That's definitely something that I've  
21 talked about is how that is an important part of  
22 this causal mechanism, that even if a child -- say  
23 you have two children and they're both exposed to  
24 the same amount of lead, that some children, their  
25 genetics, which may be related, as suggested by

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1 some of these studies, to their propensity to be  
2 autistic or to have ADHD.

3 Those genetics may impact -- may affect  
4 the impact of the lead, the brain toxicity, how  
5 long the lead stays in their body. That's what  
6 I'm talking about is the interaction with  
7 genetics.

8 It seems very plausible to me. I talk  
9 about that in my report. That's not confounding.  
10 That is part of the causal mechanisms. That's why  
11 baby food needs to be safe for everyone.

12 That's why I was talking about lead paint  
13 earlier.

14 Q. I think you may be talking about something  
15 a little different.

16 My question is, have you entertained the  
17 possibility that the genetic changes that can  
18 cause autism or ASD, those genetic changes can  
19 also affect the way kids metabolize lead or  
20 arsenic so that their levels are higher as a  
21 result of the genetic mutations?

22 A. Absolutely. That's what I talked about in  
23 here. But those are not coincidental. There's a  
24 plausibility that you have these genes that cause  
25 autism.

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1 Oh, and by chance they also -- because  
2 genes affect different things. Oh, look. They  
3 happen to also increase the body burden of these  
4 neurotoxins but totally just coincidentally. Just  
5 by chance. Not in a way such that the neurotoxins  
6 are related. That's just not plausible.

7 It's so wildly coincidental and unlikely.  
8 It would be like saying, oh, look, there is these  
9 genes that increase the risk of lung cancer, and  
10 they also affect the metabolism and the toxicity  
11 of nicotine but just by chance.

12 Not because nicotine causes -- not because  
13 cigarette smoking causes lung cancer but just --  
14 they do different things and they happen to both  
15 do these same things. That sounds to me wildly  
16 implausible.

17 Q. But you just pointed out that the same  
18 genes can have a variety of different and  
19 unrelated biologic effects. Correct?

20 A. Yes. Absolutely. What is far more likely  
21 is that there are these genes that impact the risk  
22 of neurodevelopmental outcomes because they impact  
23 how neurotoxins, including heavy metals, impact  
24 those diseases.

25 Just like we know that the genes -- it's

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1 widely assumed that the genes that impact how  
2 cigarette smoke is processed in the body, they  
3 impact the risk of lung cancer because they do  
4 that. Not just coincidentally.

5 MR. KLATT: Object to the  
6 nonresponsiveness of the answer.

7 Can we take a quick break for a second?

8 MR. ESFANDIARY: Sure.

9 THE VIDEOGRAPHER: This concludes Media  
10 Number 7. Going off the record, 5:19 p.m.  
11 (Recess, 5:19 p.m. to 5:35 p.m.)

12 THE VIDEOGRAPHER: This is the beginning  
13 of Media Number 8. Going back on the record,  
14 5:35 p.m.

15 EXAMINATION BY COUNSEL FOR PLUM, PBC  
16 BY MR. SACHSE:

17 A. Good evening, Doctor. We've met before.  
18 My name is Will Sachse. I represent Plum. I'm  
19 going to ask you a few follow-up questions, if  
20 that's okay.

21 A. Sure.

22 Q. I think I'd like to actually start where  
23 we ended.

24 A few minutes ago I believe you agreed  
25 that the genetic changes that can result in autism

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1 can also be genetic changes that cause elemental  
2 dysregulation in a child. Is that fair?

3 A. That's been suggested in the literature as  
4 a possibility for what's going on. I talk about  
5 that in my report.

6 Q. So here's my question: If you've got a  
7 study that shows that children with autism have  
8 higher levels of lead and lower levels of  
9 essential nutrients, how do you go about  
10 determining whether that result is due to the  
11 genetic changes that lead to autism versus the  
12 genetic changes that lead to dysregulation?

13 A. Sorry. I'm lost.

14 Q. Let me try it again.

15 A. Late in the day.

16 Q. You agree -- I think you've said this  
17 previously -- that genetics play an important role  
18 in autism. Right?

19 A. Yes. Like all neurological diseases.

20 Q. Sure. And I think you'd agree that there  
21 are some cases where the autism is due solely to  
22 those genetic changes. Correct?

23 MR. ESFANDIARY: Objection, misstates her  
24 testimony.

25 A. You'd have to show me where, you know --

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1 where you're taking that from.

2 Q. I'm just asking you a question as somebody  
3 who has studied in this area.

4 A. So that's a question of more of specific  
5 causation, whether there are highly penetrant  
6 genes that, you know, would make it so that a  
7 child would be autistic no matter how much lead  
8 they were exposed to.

9 Q. Sure. And I understand in the specific  
10 causation context. I'm asking more in the general  
11 causation context because if you -- let me just  
12 ask the question.

13 You agree that genetics is a -- plays an  
14 important role in causing autism generally.  
15 Correct?

16 A. Yeah. There's a genetic role in autism.

17 There's a lot of sort of uncertainty and  
18 debate in terms of how -- the percentage of autism  
19 that can be attributed to genetics versus heavy  
20 metals.

21 There's going to be an overlap. That's  
22 what I would say has been more recognized over --  
23 probably since I published my dissertation is, you  
24 know, at the time when I was publishing my  
25 dissertation we were talking about, like, genetics

1 or environmental factors.

2 And over the past, you know, two decades I  
3 would say there's a lot more recognition of  
4 epigenetic changes and the interplay between genes  
5 and environment.

6 And so say, for example, I probably do --  
7 as sort of an example, I probably do have genes  
8 that would really, really, really increase my risk  
9 of lung cancer if I smoked.

10 The fact that I don't smoke makes those  
11 genes irrelevant. But that's still a risk factor  
12 I have. It's only relevant in that context.

13 The fact that all children are exposed to  
14 lead or the vast majority of children are exposed  
15 to lead means that there could be genetic  
16 mechanisms related to the neurotoxicity of lead  
17 related to genetics that they would apply to any  
18 children that had those genes.

19 Q. Okay. That's super helpful. So let me  
20 see if I can untangle this.

21 When you're evaluating a study, how do you  
22 go about deciding whether the result that you see  
23 of autism is due directly to the genetic changes  
24 that cause autism versus indirectly from genetic  
25 changes that lead to -- contribute to autism but

1 also can contribute to elemental dysregulation?

2 A. It would depend on the genes. I mean,  
3 like, what are, like, the -- there are advanced  
4 statistical methods that would help disentangle  
5 mediation, mediation analyses for example, or  
6 interaction analyses.

7 At the end of the day, it doesn't always  
8 matter, you know. We see that there's this  
9 increase in lead burden. And the point is that  
10 some children might be just far more -- we know  
11 some children are far more susceptible to lead.

12 The reason why we -- why we regulated lead  
13 out of house paint is not because house paint was  
14 going to cause cognitive impairment in every  
15 single person but because on a population-wide  
16 level there was going to be detriments that was  
17 going to be bigger in some people.

18 We need to make house paint safe for  
19 everyone, just like we need to make toys safe for  
20 all children, just like we need to make food safe  
21 for all children regardless of how well their  
22 bodies metabolize, detoxify, excrete that lead.

23 Q. Okay. Thank you for that answer.

24 A. It's involved in the causal mechanisms.

25 Q. Okay. Thank you for that answer.

1 MR. SACHSE: Respectfully, I'm going to  
2 move to strike everything after "It would depend  
3 on the genes."

4 Q. Let's just move on, and I want to talk now  
5 about your specific process.

6 When you were looking at all of the  
7 studies that you reviewed before forming your  
8 opinions here, what was the methodology that you  
9 used to determine the extent to which it was --  
10 the results that you were seeing were due to  
11 elevated levels of lead or arsenic versus a  
12 genetic component, a preexisting genetic component  
13 in the children with autism?

14 A. I think what you're asking is what are the  
15 mechanisms? What are the mechanisms involved in  
16 this lead exposure? Do those mechanisms involve  
17 genes?

18 That wasn't part of my charge. It doesn't  
19 actually --

20 Q. I'm sorry. I'm asking a different  
21 question.

22 A. It's hard for me to finish if you're not  
23 interrupting me but you're going, like as I talk.  
24 It feels like an interruption.

25 Q. I apologize. Go ahead.

1 A. So what you're asking me about is what are  
2 the mechanisms by which increased body burden of  
3 lead is associated on a population-wide level with  
4 lead and ADHD. To what degree is genetics part of  
5 that mechanism.

6 That wasn't really part of my -- part of  
7 my charge. For me, I was interested in does an  
8 increased body burden of lead and arsenic increase  
9 the risk of autism and ADHD. Yes. Yes.

10 The evidence shows that increased exposure  
11 to lead and to arsenic increases the risk of  
12 autism and ADHD. To what extent do -- does  
13 genetics modify that exposure? That wasn't part  
14 of my charge. I don't have an answer for you to  
15 what extent those mechanisms, those mediation --  
16 those mediation components are working.

17 I think for this matter it doesn't matter  
18 because what we need is, we need the exposures  
19 in -- the lead and arsenic exposures in our world  
20 to decrease because people don't know what their  
21 genetics are.

22 In an ideal world where there's much more  
23 precision medicine -- we've been talking a lot  
24 recently in the medical world about precision  
25 exposures.

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1 In the future, when you're born and you  
2 know your genetics and you're, like, oh, look, me,  
3 I am someone who can tolerate lead very well and  
4 I'm not, then we can better understand how diet  
5 should be modified.

6 We're not there yet. In the absence of  
7 that, exposures need to be reduced to reduce the  
8 burden of autism and ADHD on the population.

9 Q. Okay. So I appreciate that lengthy  
10 answer. It was not exactly the question I was  
11 asking. I know your counsel will object.

12 MR. SACHSE: I'm just going to put on the  
13 record you have been giving lengthy, lengthy  
14 answers that are not directly responsive to  
15 questions this entire afternoon. And so we may  
16 very well have to go to the Court and seek more  
17 time.

18 I am going to finish today, but I just  
19 wanted to let you know if you let me ask my  
20 questions and try to answer them precisely,  
21 hopefully we will be done with this today. Okay?

22 A. Sure.

23 Q. All right. Good. And really I heard you  
24 say this wasn't part of my charge to consider the  
25 different mechanisms apart from postnatal lead and

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1 arsenic exposure. I'm sort of paraphrasing.  
2 That's what you were saying. Right?

3 A. I think part of my -- so my charge was  
4 to --

5 Q. I'm sorry. Let me withdraw. Let me back  
6 up and just ask a better question. Okay?

7 Your charge was not to consider the role  
8 that genetics play in causing autism. Is that  
9 right?

10 MR. ESFANDIARY: Objection, misstates her  
11 testimony.

12 A. My role was to determine if lead and  
13 arsenic are causally associated with autism and  
14 ADHD. To do that, I have to think about genetics  
15 and I have to review the entire literature, many  
16 of which talked about this, talked about . . .

17 So part of the Bradford Hill criteria  
18 considered plausibility. Do we -- is there a  
19 mechanism involved. And sometimes we can  
20 determine that an association is causally  
21 associated with the outcome even if we don't know  
22 the mechanism yet.

23 So there was enough evidence to say that  
24 smoking caused lung cancer before we really  
25 understood the mechanism. But when we have more

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1 data and more understanding of mechanisms, it  
2 helps our causal inference.

3 So there's been a lot of work sort of  
4 thinking about -- and I described it -- what are  
5 the potential mechanisms.

6 And for me, knowing that genetics plays a  
7 role in autism and ADHD, I paid attention to how  
8 genetics could be involved in that mechanism.

9 So it was part of my charge.

10 Q. Okay. Great. What precisely did you do?  
11 What method did you use to consider the role of  
12 genetics in the results that you were seeing in  
13 the studies you rely on?

14 A. Yeah. So I talked about it in my report.  
15 Should I read it?

16 Q. You shouldn't read it. You should just  
17 tell me what you did.

18 A. At this point in the night it would be a  
19 lot easier for me to read it.

20 I read the studies. I read the studies  
21 looking at the potential role of genetics in these  
22 mechanisms and all sorts of mechanisms.

23 So I talked about different research in  
24 terms of mechanisms. Some of them were in  
25 animals. I can talk about them much more clearly

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1 if I refer to my report, but I'm unable to just  
2 recite that part right now.

3 Q. That's fine. I'm really just trying to  
4 understand kind of in broad strokes, what did you  
5 do to consider whether genetics alone explained  
6 the results you were seeing in the postnatal lead  
7 and arsenic studies?

8 A. Whether all the mechanisms was -- all the  
9 causal mechanism related to genetics?

10 Q. Exactly.

11 A. That's not the assumption is that it's all  
12 mediated by genetics. In the literature that --  
13 there's data on other mechanisms too.

14 My role here was to review the literature  
15 and review it in a really rigorous way, the way I  
16 would be if I was publishing this, the way that I  
17 would be when I do all of my other research.

18 I'm a professor at a medical school, so I  
19 do research all the time and I apply the same  
20 scientific rigor when creating this report as I do  
21 in all -- in any other sort of review that I've  
22 worked on or summarizing the literature.

23 I didn't exclude studies or commentary  
24 that talked about the interplay between genetics  
25 and neurotoxins. And I'm not sitting here and

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1 being like, oh, you know, genetics are not  
2 involved in this. Genetics are believed to be  
3 involved in this, just like neuroinflammation,  
4 just like oxidative stress, just like disruption  
5 of neurotransmitters.

6 Q. So I understand -- I mean, what I think  
7 you just said is it's all mediated by genetics.  
8 My question was a little --

9 A. No, I did not say that. If I did, let's  
10 strike that because I did not mean to say it's all  
11 mediated by genetics.

12 Q. Anyway, I'm getting at a different point,  
13 which is whether -- how you went about considering  
14 whether the results that you're seeing in the  
15 postnatal lead studies were due solely to genetic  
16 autism factors versus the exposure -- the lead and  
17 arsenic exposure?

18 A. I guess if I -- if that's all that I saw  
19 in the literature and not all the other, you know,  
20 powerful work that I would see in here, then one  
21 could assume that.

22 But, I mean, this is not all about  
23 genetics. There's so much more here. And so that  
24 makes it clear that it's not all about genetics.

25 My purpose here -- I didn't conduct any

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1 original research. I reviewed all of the  
2 literature. I reviewed case-controlled studies,  
3 cohort studies, cross-sectional prevalence  
4 studies. I looked at animal studies. Basically  
5 every type of scientific literature there was.

6 And that was -- it was like a review. It  
7 wasn't a -- I didn't do any sort of formal  
8 calculations or meta-analyses in relation to lead  
9 and ADHD.

10 I did create a plot that was sort of  
11 similar to a forest plot, but I didn't do any sort  
12 of formal interaction analyses between lead and  
13 genetics.

14 There's a lot more we need to learn about,  
15 you know, all of the genetic variants involved in  
16 autism.

17 Q. So I'm actually asking about genetics  
18 independent of lead exposure.

19 What did you do to consider whether the  
20 results that you were seeing in the postnatal lead  
21 and arsenic studies were due to genetics  
22 independent of any exposure?

23 A. So I didn't -- my report doesn't focus on  
24 genes independent of lead exposure. The focus of  
25 my report is lead and arsenic. Whether -- you're

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1 saying whether there might be genes that are just  
2 much more common in children with ADHD and much  
3 seen in relation to higher exposures to lead but  
4 just by coincidence.

5 As I explained before, that just doesn't  
6 sound plausible. Like, you know, we know there's  
7 a genetic component to lung cancer. And you're  
8 suggesting that if I were summarizing or reviewing  
9 the literature on smoking and lung cancer, to what  
10 extent might I consider genes, explaining that  
11 association that had nothing to do with the  
12 cigarettes, that there are genes out there that  
13 increase the risk of lung cancer and --

14 Q. You're just repeating yourself.

15 A. Yeah. It's hard to understand this stuff.  
16 I'm an epidemiologist. This stuff might seem  
17 obvious to me. I'm trying to explain it.

18 MR. SACHSE: I'm going to stop you and  
19 strike everything after "my report doesn't focus  
20 on genes independent of lead exposure," because  
21 that was my question.

22 MR. ESFANDIARY: So you just interrupted  
23 the witness in the middle of responding to your  
24 question.

25 That's fine. It doesn't matter.

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1 What time are we on the record?

2 THE VIDEOGRAPHER: 6 hours and 43 minutes.

3 MR. KLATT: All right.

4 Q. Let me -- and again, I'm really trying to  
5 be precise here.

6 A. I'm trying to answer it as best as I can,  
7 as responsibly as I can, because I don't want to  
8 misrepresent myself. I know what you want is  
9 little, short snippets that answer your questions  
10 the way you want them, but I have a responsibility  
11 to represent my opinions accurately. And that  
12 might take more explanation. I'm doing my best.

13 Q. And I appreciate that you're doing your  
14 best. I know it's the end of a long day. We're  
15 all doing our best.

16 So you said that your report doesn't focus  
17 on genes independent of lead exposure.

18 As part of your analysis of the evidence  
19 in this case, did you consider the role of genes  
20 independent of lead exposure?

21 A. Yeah.

22 Q. And how did you do that? What was the  
23 methodology that you used to consider the role of  
24 genetics in autism independent of lead exposure?

25 A. I reviewed the literature with that in



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1 mind, understanding that there are other risk  
2 factors for autism and ADHD. I think it's  
3 important to have that as a scientist,  
4 understanding that in mind.

5 You know, reviewing all of these  
6 discussions and thinking about the fact that there  
7 are kids who are going to have ADHD regardless of  
8 how much lead they are exposed to or how much  
9 arsenic they are exposed to. And there's going to  
10 be other kids who can be exposed to a real lot of  
11 lead and not develop autism or ADHD. That was  
12 important for me to understand.

13 I guess what you're asking is how -- what  
14 was the process for me in terms of understanding  
15 the overall etiology of these outcomes. And that  
16 involves reading -- how many papers? 556 papers  
17 over the years.

18 Q. 557.

19 A. Oh, right, 557. Yes. 557. And I've been  
20 reading about autism since I was a student, since  
21 one of my professors, you know, asked me to help  
22 him do this really, really important work on  
23 autism. It wasn't something that I thought about  
24 before then. So I have had decades of sort of  
25 learning about this condition. This isn't

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1 something that I -- that Pedram called me about.  
2 Sometimes lawyers will call me and I'll  
3 have to learn about a whole new thing I know  
4 nothing about. This was not the case.

5 I have been studying autism since I was  
6 not a baby but it felt like I was a baby in my  
7 20s.

8 Q. And so switching to another area which you  
9 touched on earlier, which is prenatal exposure to  
10 heavy metals.

11 What was the methodology -- when you were  
12 looking at these postnatal lead and arsenic  
13 studies, what was the methodology you used to  
14 determine the extent to which the results that you  
15 were observing were due to prenatal versus  
16 postnatal exposure?

17 A. Yeah. So I reviewed the literature on  
18 prenatal exposure as well. I'm not here to, like,  
19 opine on whether prenatal exposure to lead or  
20 arsenic causes ASD. I haven't scrutinized the  
21 literature to that extent. But I read a lot of  
22 it. I read a lot of studies. And so I thought  
23 about, you know, is there an association?

24 The associations are not as consistent.  
25 They're not as strong as they are for postnatal

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1 exposure. But I did read that there is evidence  
2 that prenatal exposure also matters. And I  
3 thought about the fact that these children are all  
4 born already exposed to lead and to arsenic.

5 If it was a hypothetical biospecimen that  
6 didn't reflect postnatal exposure, that only  
7 reflected prenatal exposure, I would be a little  
8 bit more doubtful about, you know, making  
9 inferences about the role of postnatal exposure.

10 That's not the case. We know that  
11 children are exposed and we know that these --  
12 that lead is cumulative. And it is probably true  
13 that an increased exposure prenatally might  
14 increase, you know, a child's vulnerability to  
15 that postnatal exposure, which is all the more  
16 reason why we need to decrease postnatal  
17 exposures.

18 The fact that there are exposures outside  
19 of food just underscores the fact that we need to  
20 reduce the exposure in food more. The fact that  
21 each individual exposure is not the only exposure  
22 highlights the importance of reducing exposure to  
23 all of them because they add up.

24 Q. So after reading all of the studies, what  
25 further methodology did you apply to assess

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1 whether the results you're seeing in the postnatal  
2 lead and arsenic studies are explained by  
3 postnatal exposure versus maybe they're solely  
4 explained by prenatal exposure?

5 A. You're saying there is a hypothetical that  
6 kids who -- that kids who were exposed  
7 postnatally, it's so highly correlated with their  
8 prenatal exposure that it's really the prenatal  
9 exposure?

10 Q. That's not right.

11 A. I did think about that.

12 Q. But that's not the question I asked,  
13 though.

14 What I'm asking is whether you considered  
15 after reviewing all the literature, whether you  
16 considered that observations you were seeing in  
17 the postnatal literature were, in fact, due to --  
18 due solely to those children's prenatal exposure  
19 to lead and arsenic?

20 A. That's actually the same thing. I just  
21 said it in a more sort of scientific -- in a more  
22 sciencey way.

23 I think that argument would be -- that  
24 would have weighed on me much more if we saw this  
25 huge convincing science about -- strong science



1 about the prenatal exposure that was so much  
2 stronger than the postnatal exposure, then that  
3 might have weighed on me more, that possibility.  
4 I don't think that they are perfectly correlated.

5 And in any sort of related science, I  
6 haven't seen the argument that, you know, it  
7 doesn't really matter what the postnatal exposure  
8 is. It's so highly correlated, it's all being  
9 driven by the prenatal.

10 If that were true for autism, it would be  
11 true for other neurotoxicity too.

12 As a society, we care about postnatal lead  
13 exposure neurotoxicity. That's talked about in  
14 abundance. It's also -- prenatal exposure is  
15 also -- is also relevant.

16 If your hypothetical was true, it's  
17 perfectly correlated with prenatal exposure and  
18 all being driven by prenatal exposure, that  
19 argument would be made across the board for all  
20 neurodevelopment, for all neurotoxicity.

21 We see so many medical organizations talk  
22 about the fact that postnatal lead exposures are  
23 relevant for neurotoxicity and neurodevelopment.  
24 It would be so weird if autism was this weird  
25 exception to that.

1 since that was dropped from this case. I don't  
2 have any other standing cases that I'm working on  
3 right now that have to do with mercury. So my  
4 being up to speed on the mercury issue is maybe  
5 six months behind lead and arsenic.

6 Q. Okay. You're anticipating what I'm  
7 getting at.

8 So you are not offering opinions about  
9 whether mercury increases the risk of autism or  
10 ADHD. Is that right?

11 A. That was not part of my charge for this  
12 case. My understanding is that it might be for  
13 other cases, but for this case it wasn't.

14 And so as a result, since I think March is  
15 when I had the deposition where mercury was  
16 involved, I have not updated. I haven't looked at  
17 the literature since then in case something big  
18 came out. I haven't seen it.

19 Q. Okay. But when you were given your charge  
20 by the plaintiff's lawyers in this case, mercury  
21 was not part of that charge. Correct?

22 A. That is correct.

23 Q. I want to talk a little bit more about  
24 nutrients. You have not -- you're not offering  
25 any expert opinions on absorption, distribution,

1 Q. I'm going to switch gears because I'm  
2 running out of time here.

3 At the beginning of this deposition, you  
4 agreed that you previously had given reports in  
5 the baby food litigation in the NC case, in the  
6 Landon case, and the class action. Is that right?

7 A. There have been two class actions. There  
8 was a -- there was a baby food class action and  
9 then there was an infant formula class action.  
10 And there's also been some other studies that  
11 haven't gone to deposition.

12 Q. This is easy. You stand by the opinions  
13 you've previously given. Correct?

14 A. I'm not here to correct any opinions I've  
15 given in the past.

16 Q. I think you said that earlier.

17 In the Landon case, you also offered the  
18 opinion that exposure to mercury postnatally can  
19 cause increased -- can cause autism and ADHD. Is  
20 that right?

21 A. That's correct.

22 Q. And when you formed that opinion, did you  
23 use the same methodology that you used to form the  
24 opinions related to lead and arsenic?

25 A. Yes. But I haven't updated my opinion

1 metabolism, or excretion of metals in this case,  
2 are you?

3 MR. ESFANDIARY: Objection, misstates her  
4 testimony.

5 A. I'm sorry. It's the end of the day. Can  
6 you repeat that?

7 Q. That's okay. I don't need that.

8 You haven't studied how nutrients compete  
9 with nonnutrient metals in the body to bind to  
10 transporters, are you?

11 A. Are you asking -- I think it depends on  
12 sort of how you -- you say have I studied.  
13 Obviously I have reviewed the literature. It's a  
14 huge part of this report. I have not published  
15 anything on that myself as an author.

16 Q. And outside of studying that in connection  
17 with this litigation, have you ever previously  
18 investigated how nutrients compete with metals in  
19 the body to bind to transporters?

20 A. I don't know how what you're asking is  
21 different from me saying that I haven't published  
22 on it myself.

23 I don't have -- nor do I have any, like,  
24 ongoing analyses that I haven't published yet on  
25 that. All of my work on that topic has been in

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1 terms of the literature review for this case and  
2 for other -- the class action cases involve that  
3 too.

4 I employ the same methodology in creating  
5 this report as I would be if I were writing a  
6 review article for publication or in any sort of  
7 white paper or work as part of my academic work.  
8 But I haven't published on that.

9 Q. Okay. You're not offering any expert  
10 opinions in this case about which essential  
11 nutrients compete with which heavy metals at which  
12 sites, which transporter cells within the body,  
13 are you?

14 MR. ESFANDIARY: Objection, misstates her  
15 testimony.

16 A. I'm not offering any opinions beyond that  
17 which I have in here. So I don't want to say --  
18 I'm not saying that and then I've actually written  
19 something in my report.

20 So I guess I have no plans to opine on  
21 that beyond what I have in here. If some research  
22 comes out between now and this hearing, that would  
23 be relevant. I can't say I wouldn't rely on that  
24 in terms of forming my opinions.

25 I don't think I'm going to be -- that's

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1 not a main part of my focus, I guess.

2 Q. You read my mind, Doctor. That is what I  
3 was getting at.

4 So -- and you've referred now to the work  
5 that you did specific to nutrients in this  
6 litigation.

7 And am I correct that the studies that you  
8 reviewed that led you to the conclusion that the  
9 evidence is inconclusive, those were all studies  
10 about supplementation of nutrients in children  
11 with high levels of lead exposure or arsenic  
12 exposure?

13 MR. ESFANDIARY: Objection, misstates.

14 A. No.

15 MR. ESFANDIARY: Go ahead.

16 A. No. It was a long section. There were so  
17 many different kinds of studies. The results were  
18 all over. They're largely showing no association,  
19 which is why I said it was inconclusive.

20 What you describe really just represents  
21 such a small portion of the evidence that informed  
22 my opinions on that. There was so much.

23 Q. I'm running out of time, so just a couple  
24 more questions.

25 I think you previously testified that you

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1 reviewed some of the expert reports from the  
2 defense experts in this case, in this litigation.  
3 Is that right?

4 A. That is correct.

5 Q. Okay. And did you review the expert  
6 report of Dr. Fombonne?

7 A. In this one?

8 Q. Yes.

9 A. I have definitely reviewed stuff from  
10 Dr. Fombonne in the past. I'm not sure if I did  
11 from this round.

12 Q. Did you review -- do you recall any  
13 defense epidemiology opinions that you reviewed  
14 after submitting your report but before submitting  
15 your rebuttal in this litigation?

16 A. After submitting my report. I think what  
17 I reviewed was all before the rebuttal. My  
18 understanding was that they were -- the charge was  
19 only -- the rebuttal was only in relation to  
20 commenting on whether Dr. Jones's new estimates  
21 changed my opinion. And that was the extent of  
22 what I was asked to do.

23 Q. Did you see some criticisms of some of  
24 your opinions that the defense experts offered?

25 A. Criticisms? I don't think I saw

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1 criticisms of my -- I guess you could call it  
2 criticisms.

3 I do remember seeing my name in relation  
4 to the fact that my name kept coming up in that  
5 there were criticisms of Dr. Jones's calculations  
6 that then I relied upon. I haven't read -- I've  
7 read very small portions of those expert reports.

8 Q. When you reviewed those small portions of  
9 the expert reports, did you see anything that you  
10 thought was incorrect that you wanted to respond  
11 to?

12 A. I wouldn't say I want. Honestly, I never  
13 choose to do a rebuttal. I am perfectly happy  
14 with their -- with rebutting things at deposition,  
15 at hearing. It's just more work for me. It's not  
16 that I agreed with everything that was written by  
17 any means, but I never said to the lawyers, you  
18 know, I must create a new report on this.

19 Q. So I just told your counsel -- you saw  
20 some baseball hand signals there. I'm --

21 A. We're a little bit over time. I'm okay.

22 Q. We're at time. I just have literally  
23 three or four more questions.

24 A. Okay.

25 Q. The first question, sitting here today,

|  |  |
|--|--|
| <p style="text-align: right;">Page 325</p> <p>1 there's nothing that you saw in those defense</p> <p>2 expert reports that you wanted to include in a</p> <p>3 rebuttal?</p> <p>4 A. I didn't rebut anything. I didn't agree</p> <p>5 with, like, the little things -- all the little</p> <p>6 things that I saw. I didn't feel -- I didn't want</p> <p>7 to write anything.</p> <p>8 Q. That's fair. You're under oath, after</p> <p>9 all.</p> <p>10 Second question: Would you agree or do</p> <p>11 you agree, Doctor, that there are no studies -- no</p> <p>12 epidemiology studies specifically examining</p> <p>13 whether commercial baby food causes autism or</p> <p>14 ADHD?</p> <p>15 MR. ESFANDIARY: Objection, asked and</p> <p>16 answered previously.</p> <p>17 A. Oh, I've gotten that question before.</p> <p>18 Q. Today?</p> <p>19 A. I mean, probably. It's a classic that's</p> <p>20 fun to recycle.</p> <p>21 I haven't seen any studies comparing kids</p> <p>22 who are autistic and kids who are not and the</p> <p>23 amount of commercial baby food they have consumed.</p> <p>24 It could be out there. I would be surprised if it</p> <p>25 was out there and I didn't see it.</p> | <p style="text-align: right;">Page 326</p> <p>1 My charge related to heavy metal and</p> <p>2 irrespective of sources. Just like when I study</p> <p>3 PFAS, I study PFAS body burden irrespective of the</p> <p>4 sources.</p> <p>5 Q. And I shouldn't have said three questions.</p> <p>6 A. We can do one more. I'm not going to hold</p> <p>7 you to three.</p> <p>8 Q. Well, this is my last question, so I want</p> <p>9 to make it count.</p> <p>10 A. Do it.</p> <p>11 Q. I know. Yes, I am, though, because it's</p> <p>12 kind of a big one.</p> <p>13 Previously in response to questioning from</p> <p>14 my co-counsel you agreed that you considered</p> <p>15 confounders when evaluating the postnatal lead and</p> <p>16 arsenic studies.</p> <p>17 Can you give us the list of the</p> <p>18 confounders that you considered?</p> <p>19 A. I would say for most studies or -- not for</p> <p>20 most studies. For a lot of studies I mentioned,</p> <p>21 the ones that were considered -- I don't have an</p> <p>22 exhaustive list.</p> <p>23 Q. And when you say you mentioned, you're</p> <p>24 sort of gesturing towards your report.</p> <p>25 So you mentioned the confounders that you</p> |
| <p style="text-align: right;">Page 327</p> <p>1 considered in the text of your report. Is that</p> <p>2 fair?</p> <p>3 A. I talked about confounders. Yup.</p> <p>4 Q. And so we can rely on your report for the</p> <p>5 universe of confounders that you considered when</p> <p>6 evaluating those studies. Is that fair?</p> <p>7 A. I don't know if that's fair.</p> <p>8 Q. Sitting here today, are there any</p> <p>9 confounders other than what you've put in your</p> <p>10 report that you considered when evaluating those</p> <p>11 studies?</p> <p>12 A. I wouldn't say there aren't any that I</p> <p>13 didn't consider. I mean, I considered</p> <p>14 confounding. I considered, you know . . .</p> <p>15 Q. Now that I think we're fully in Alice in</p> <p>16 Wonderland, I have no further questions.</p> <p>17 MR. ESFANDIARY: Cool. Thank you. No</p> <p>18 questions.</p> <p>19 THE VIDEOGRAPHER: This concludes the</p> <p>20 deposition of Hannah Gardener, Sc.D. Going off</p> <p>21 the record, 6:16 p.m.</p> <p>22 (Off the record at 6:16 p.m.)</p> <p>23</p> <p>24</p> <p>25</p>   | <p style="text-align: right;">Page 328</p> <p>1 COMMONWEALTH OF MASSACHUSETTS</p> <p>2 SUFFOLK, SS.</p> <p>3</p> <p>4 I, Michelle Keegan, Registered Merit Reporter</p> <p>5 and Notary Public in and for the Commonwealth of</p> <p>6 Massachusetts, do hereby certify that HANNAH E.</p> <p>7 GARDENER, SC.D., the witness whose deposition is</p> <p>8 hereinbefore set forth, was duly sworn by me and</p> <p>9 that such deposition is a true record, to the best</p> <p>10 of my ability, of the testimony given by the</p> <p>11 witness.</p> <p>12 I further certify that I am neither related to</p> <p>13 or employed by any of the parties in or counsel to</p> <p>14 this action, nor am I financially interested in</p> <p>15 the outcome of this action.</p> <p>16 In witness whereof, I have hereunto set my hand</p> <p>17 and seal this 1st day of August, 2025.</p> <p>18</p> <p>19</p> <p>20</p> <p>21</p> <p>22 Notary Public</p> <p>23 My commission expires:</p> <p>24 May 15, 2026</p> <p>25</p>  |

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|----------|---|
| Page 329 |   |
| 1        | ERRATA SHEET                                    |
| 2        | I, HANNAH E. GARDENER, SC.D., do hereby certify |
| 3        | that I have read the foregoing transcript of my |
| 4        | testimony, and further certify that said        |
| 5        | transcript is a true and accurate record of my  |
| 6        | testimony (with the exception of the following  |
| 7        | corrections listed below):                      |
| 8        | Page Line Correction                            |
| 9        | -----   |
| 10       | -----   |
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| 20       | -----   |
| 21       | Signed under the pains and penalties of perjury |
| 22       | this day of , 2025.                             |
| 23       |   |
| 24       |   |
| 25       | HANNAH E. GARDENER, SC.D.                       |